RESEARCH

Predictors of Intention to Quit Smoking Among Jordanian University Students

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ABSTRACT

Purpose: To identify predictors that influence tobacco smoking cessation among Jordanian college students and to test the utility of the Trans-Theoretical Model for future cessation programs in this population.

Method: A cross-sectional survey of randomly selected college students (18 to 22 years of age) who were smokers was conducted at two Jordanian universities. The surveys included the: Tobacco Use Questionnaire; Tobacco Use Self-Efficacy; Rosenberg Self-Esteem Scale; Barriers to Cessation; and the Fagerstrom Tobacco Nicotine Dependency Scale. Due to the complex nature of the contextual and individual factors related to smoking behaviour, a structural equation modeling approach was used to identify variables that may influence participation in tobacco smoking cessation programs.

Results: There was a 75% response rate with a total of 800 students (90% male) completing the survey. Three factors were identified as major contributors toward quitting smoking: a) a high stage of readiness, b) previous experience with barriers to smoking cessation, and c) past experience with quitting.

Conclusions: The findings suggest that the value of smoking cessation programs should not be measured on recidivism rates alone. The implications are that such programs should make return to treatment easy and as guilt free as possible to improve ultimate long-term smoking abstinence.

MeSH terms: Jordan; smoking; smoking cessation; adolescent; self efficacy

La traduction du résumé se trouve à la fin de l'article.

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Current data from Jordan and other Arab developing countries reveal a high prevalence of cigarette smoking among young people, especially university students; the recent prevalence of smoking among university students was 28.6% (50.6% for males and 6.5% for females).[1-3] Although there is widespread consensus that smoking cessation programs should be tailored for specific populations, there is little background information on approaches to smoking cessation in Arab countries. This study was designed to explore variables that might influence students to participate in smoking cessation programs and to identify barriers they experience when attempting to quit smoking.

Several theoretical models have been proposed to explain cessation approaches to quitting smoking. Although each theory emphasizes different factors, all view smoking cessation as dependent upon physiological, psychological, environmental, and social factors.[4-7] Certainly physiological factors are relevant to smoking cessation; smokers develop nicotine dependence and exhibit withdrawal symptoms when they try to stop smoking.[7] Smoking cessation in youth is also influenced by psychological factors such as readiness and motivation to change, and self-efficacy.[8,9] The Trans-Theoretical Model (TTM) has been instrumental in drawing attention to readiness to quit as a salient variable. The TTM model proposes that a person trying to quit smoking progresses through five stages. These stages include: pre-contemplation, contemplation, preparation, action, and maintenance.[7,10,11] In addition, self-efficacy is a core construct of the TTM[8] and is positively associated with stage of change.[10] Thus, self-efficacy scores tend to be low among pre-contemplators and much higher as the smoker enters the "action" stage and maintains abstinence.[6] Consequently, researchers have compared the first three stages of change to a composite of variables related to past and current smoking/quitting behaviours. The results indicated that the composite variables were a better predictor of cessation than the stages of change.[10] Furthermore, many other studies have uncovered the multidimensional relationship among smoking, self-efficacy, self-esteem, and coping skills, which indicated that youth with low self-esteem and low self-efficacy may try strategies such as smoking to cope with the stressors encountered in growing up.[3,7,8]

Further, environmental and social factors that influence smoking and quitting include the following: having family members and friends who smoke; economic deprivation; poor physical and mental health; family conflict; adjusting to psychological changes associated with physical maturation; and social hassles.[12-14] Demographic variables have also been examined in relation to smoking cessation and they include: age of initiation, gender, ethnicity, and socioeconomic status;[12-14] however, socioeconomic status may be considered as a possible confounding variable.[13] Some studies have reported that female gender has been associated with lower smoking quit rates,[14] but other studies report the opposite.[13,14] However, women experience more social pressure to quit.[14]

Research hypotheses

Due to the complex nature of the contextual and individual factors related to smoking behaviour, a structural equation modeling approach was used to examine three inter-related research hypotheses regarding Intention to Quit (IQ), as follows:

- IQ is influenced by stage of change and readiness.
- IQ is influenced by smoking history, smoking habits and past attempts to quit smoking, and self-esteem.
- IQ is influenced by tobacco use self-efficacy in a variety of social settings (home, schools, parties, etc.).

This analysis plan was designed to generate a parsimonious model or set of interacting variables while eliminating extraneous and non-contributing variables. The model generated by this statistical procedure was also expected to provide information on the sequence and direction of relationships between and among the set of relevant variables.

METHODS

Setting and sample

This study was conducted at two public universities located in the northern and eastern areas of the Hashemite Kingdom of Jordan. The total of undergraduate students in both universities was approximately 18,000 students. The sampling plan was to achieve a total of 800 student smokers with 400 from each university and to randomly select students by class until the total sample was attained. Once research and ethical committees at both universities approved the study, a list of all undergraduate classrooms was obtained from the registration office at each university. The number of each classroom was written on slips of paper that were drawn randomly and listed in order of random drawing. The investigators went to the classrooms according to the order of random drawing and recruited students who acknowledged that they were smokers. Participation was voluntary and anonymous. The study investigators were not present during the time students completed the questionnaire.

Measures

Six instruments were used to measure the study variables in the student sample. The Appendix provides a summary of the instruments, their purposes, number of items and response type. Each of the instruments was translated from English to Arabic, and then back translated from Arabic to English. The translated version and original instruments were reviewed by a committee comprised of four experts in the topic who are competent in both Arabic and English languages to consider the equivalence of terms, clarity and cultural adaptation. Modifications were made according to the committee's recommendations. A pilot study was conducted to test the reliability of the translated instruments and to check for ease and clarity of responding to its items. Forty baccalaureate nursing students completed the questionnaire. The wordings of some items were changed slightly for the sake of clarity. The internal consistency for the Rosenberg Self-Esteem Scale (SES) was 0.75, the mean was 3.2 with a range of 2 to 4 indicating relatively high self-esteem in the pilot group. The Tobacco Use Self-Efficacy (TUSE) internal consistency was 9.90; the internal consistencies for the barriers to cessation subscales were 0.68, 0.75, and 0.80 respectively.

RESULTS

Using a random selection procedure for recruiting from university classrooms, the target sample of 800 students was attained. The response rate was 75% from among all students who were invited to participate. Table I shows that the majority of students (72.7%) were in the 20-22 year old range. Most (98%) were single, lived in urban areas (75%), and were Moslem (98%). Relatively few students had annual family incomes above US $8,400 (10%) and most had annual family incomes below US $4,200 (57%). Table II shows that daily cigarette consumption is relatively high, with more than half of the students (65%) reporting smoking more than 15 per day. Although 84% had considered quitting smoking and 71% of students had attempted to quit previously, very few were interested in using a cessation program (15%) and many others were uncertain about cessation programs (40%). Results from the structural equation modeling approach using the LISREL method from the LISREL 8[20] statistical program are also presented in tables. Table III provides the zero-order correlations

TABLE I

Sample Demographics (N=800)

	n	%
Level of Education		
University 1	416	52
University 2	384	48
Sex		
Male	720	90
Female	80	10
Age (years)		
18-19	218	27.5
20-22	582	72.7
Marital Status		
Single	796	98
Married	4	2
Residence		
Rural	195	24.5
Urban	605	75.5
Ethnic Background		
Moslem	787	98.4
Non-Moslem	13	1.6
Family Income (US$)		
<$2,100	168	21
$2,100-4,200	288	36
$4,200-6,300	175	21.8
$6,300-8,400	92	11.5
>$8,400	80	10

TABLE II

Cigarette Use and Smoking Cessation (N=800)

	n	%
Cigarettes per day		
<5	120	15
5-15	160	20
15-20	320	40
≥20	200	25
Have considered quitting smoking	672	84
Had attempted to quit previously	568	71
Currently thinking about quitting	296	37
Interested in using a cessation program	120	15
Uncertain about using a cessation program	320	40

TABLE III

Correlations Between the Intention to Undergo a Smoking Cessation Treatment and Related Variables (N=800)

	Age	Gender	Income	FTND	TUQ	Stage of Change	Internal Barriers	External Barriers	Addictive Behaviours	TUSE	SES	Readiness
Gender	-0.05	–										
Income	-0.08*	-0.10**	–									
FTND	0.14****	-0.11***	-0.12***	–								
TUQ	0.18****	0.04	0.05	0.28****	–							
Stage of change	0.05	0.14****	-0.09**	0.13****	0.25****	–						
Internal barriers	-0.03	0.03	0.02	0.05	0.15****	0.23****	–					
External barriers	-0.02	-0.11***	0.01	0.07*	0.17****	0.17****	0.20****	–				
Addictive barriers	0.13****	0.11***	-0.16****	0.30****	0.20****	0.16****	0.06	0.11***	–			
TUSE	-0.04	-0.12****	0.18****	-0.24****	-0.11***	-0.07**	0.05	0.03	-0.38****	–		
SES	0.03	0.01	0.05	0.01	0.12****	0.13****	0.26****	0.22****	-0.06	0.13****	–	
Readiness	-0.01	-0.07*	-0.01	0.12***	0.15***	0.13****	0.10***	0.11***	0.11**	-0.02	0.06	–
IQ	0.09**	-0.05	-0.04	0.26****	0.32****	0.22****	0.21****	0.18****	0.23****	-0.14****	0.08**	0.59****

*p<0.10 **p<0.05 ***p<0.01 ****p<0.001

TABLE IV

LISREL Estimates of Direct, Indirect, and Total Effects of Theoretical Relevant Variables on the Intention to Undergo Cessation (N=800)

	Direct	Indirect	Total
Age	0.04	0.04*	0.08**
Gender	-0.04	-0.01	-0.05
Income	-0.01	-0.03	-0.04
FTND	0.10***	0.07***	0.17****
TUQ	0.15***	0.09***	0.24****
Stage of change	0.06*	0.09***	0.14****
Internal barriers	0.11****	0.03	0.13****
External barriers	0.06**	0.03	0.10***
Addictive barriers	0.06	0.04*	0.10***
TUSE	-0.07**	0.01	-0.06
Readiness	0.00	0.01	0.00
IQ	0.52****		0.52****
R^2			45%

*p<0.10 **p<0.05 ***p<0.01 ****p<0.001

among the variables. These comparisons show many weak (r<0.30) but statistically significant associations among the variables. Moderate associations were found when comparing the following variables: intention to quit and readiness for cessation (r=0.59, p<0.001); tobacco use self-efficacy and addictive behaviours barriers to cessation (r=-0.38, p<0.001; intention to quit and tobacco use (r=0.32, p<0.001). Table IV provides the direct, indirect and total effects by individual predictor variable. A saturated model was specified and the assumed causal order followed the categorization described previously. Variables in a given category are assumed to be influenced by those belonging to preceding categories and to have influence on those belonging to following categories. The significant total effect of age on the intention to quit (Table IV) means that the senior older students are more inclined to undergo an IQ. Examining the barriers to cessation three main subscales; the internal affective states; external lack of social support; and the addictive behaviour according to Table IV, all total effects of theses subscales are positive. However, our hypotheses regarding the effects of self-esteem for intention to quit were not supported at all. Finally, our hypothesis about the positive impact of stage of change towards quitting was strongly supported (the total being 0.52).

DISCUSSION

Due to the small number of female participants, the findings based on sex cannot be generalized to the study population. Smoking in public is not socially acceptable for women in the Arab culture. Thus, it is unlikely that many eligible female students would publicly volunteer for the study for that very reason. Also many university classes have few female students, and for similar cultural reasons, females will defer volunteering for a research study due to the presence of more males in the class. As a result, the findings must be assumed to be applicable to issues of smoking cessation in college-age Arab males, but cannot be applied to college-age Arab females.

The model generated by the statistical analysis suggests that the TTM is useful in describing the potential for smoking cessation in the study sample. The model shows that seven variables (older age, internal barriers, external barriers, addictive behaviours, nicotine dependency, and tobacco use self-efficacy) apparently play a part in readiness for smoking cessation. Table IV shows that each of these variables demonstrated significant direct and/or indirect value in predicting intention to quit. The model also shows that information-seeking with regard to cessation programs, which may be a consequence of intention to quit or an antecedent of that intention, has more of an indirect effect on IQ. However, the analysis shows that neither self-esteem (one variable included in Hypothesis 2) nor economic status play a part in the model.

The data showed that stage of change (degree of readiness) regarding intention to quit (Hypothesis 1) was strongly supported in the model (Direct Effect = 0.52, p<0.001). It is noteworthy that the most important factor directly affecting IQ appears to be a positive attitude towards quitting (one variable in Hypothesis 2). That is, past experience with quitting may have a positive impact on IQ because of familiarity with the process and/or experience with the formal or informal treatment options available. Also, the data infer that the slightly older students are more inclined toward IQ. However, the proposal that TUSE would contribute to IQ (Hypothesis 3) could not be fully supported by the analysis because only the Direct Effect was significant.

Limitations of the present study include the small number of females in the sample,

APPENDIX

Study Instruments

Title and Abbreviation	Purpose/Focus	Items and Response Types
Demographic and Cultural Information - DCI	Background and cultural information about participants.	21 items: multiple choice.
Tobacco Use Questionnaire – TUQ[15]	Smoking history and smokeless tobacco use, smoking habits, past attempts to quit smoking, the desire to quit.	21 items: last 4 items addressed Stage of Change: planning to decrease tobacco use in next week, month, 6 months, or year, and whether he/she was trying to stop smoking.
Tobacco Use Self-Efficacy - TUSE[16]	Tobacco use behaviour in adolescents; focusses on how a person is sure that he/she could resist tobacco use in a variety of situations, including home, schools, parties, with friends, etc.	36 items: 4-point Likert format, ("I am very sure that I would use tobacco" to "I am very sure that I would not use tobacco").
Rosenberg Self-Esteem Scale – SES[17]	Self-worth and feelings about self.	10 items: forced-choice Likert format.
Barriers to Cessation – BC[18]	Perception of barriers to stopping smoking with three subscales: • *Internal* (affective states - isolation, boredom, depression and weight gain). • *External* (lack of social support, pressure, etc.). • *Addictive* behaviours (cravings, nervousness, etc.).	21 items: 4-point Likert format ("Not a barrier" to "Large barrier"), with three subscales (7 to 8 items each).
Fagerstrom Tobacco Nicotine Dependency - FTND[19]	Perceptions of dependence: how soon tobacco use begins each day, which cigarettes a person could do without, how smokers cope in places where they cannot smoke, and how much and how deeply they smoke.	6 items: multiple choice.

the cross-sectional design and the statistical plan. The structural equation modeling approach is based on theoretical and logical relations and is a more powerful statistical tool when used in a longitudinal design. Therefore, the causal ordering of the variables in this study rests largely on theoretical and logical assumptions and not on empirical evidence. Only a longitudinal study can offer such ultimate evidence of the correct ordering.

CONCLUSION

The purpose of this study was to identify the variables that may predict a college student's intention to quit smoking and participation in a smoking cessation program. Although this is the first such study in Jordan, it appears that the pattern of quitting behaviour among young adult Jordanians is not different from those reported in developing countries.[21-23] In sum, it seems that three factors are major contributors toward quitting smoking: a) a high stage of readiness, b) experience with barriers to smoking cessation, and c) past experience with quitting.

These findings suggest that value of smoking cessation programs should not be measured on recidivism rates alone. In fact, these cessation programs must strategically address two important issues. First, smoking cessation programs must create easy pathways for clients to return to the program when they have failed at abstinence and want to stop again. Second, smoking cessation programs must create techniques to assuage the personal guilt that clients may feel because of previous failures to refrain from smoking. Both strategies will increase the likelihood that smokers persist in cessation efforts and ultimately achieve long-term success.

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RÉSUMÉ

Objet : Déterminer les variables prédictives qui influencent le renoncement au tabac chez les collégiennes et les collégiens jordaniens et tester l'utilité du modèle transthéorique des étapes du changement pour les futurs programmes de renoncement au tabac dans cette population.

Méthode : Nous avons mené, dans deux universités jordaniennes, un sondage transversal auprès de collégiennes et de collégiens fumeurs (de 18 à 22 ans) sélectionnés au hasard. Le sondage comportait : un questionnaire sur le tabagisme; un questionnaire sur l'auto-efficacité liée au tabagisme; l'échelle de l'estime de soi de Rosenberg; les obstacles au renoncement; et le test de dépendance à la nicotine de Fagerström. En raison de la complexité des facteurs contextuels et individuels liés à l'usage du tabac, nous avons opté pour une approche de modélisation en équations structurelles afin de déterminer les variables susceptibles d'influencer la participation à des programmes de renoncement au tabac.

Résultats : Nous avons obtenu un taux de réponse de 75 %, soit 800 répondants et répondantes (90 % d'hommes). Nous avons cerné trois grands facteurs contribuant au renoncement au tabac : a) un niveau de préparation élevé, b) une expérience antérieure des obstacles au renoncement au tabac et c) une expérience de renoncement préalable.

Conclusions : Nos constatations donnent à penser qu'il ne faut pas mesurer la valeur des programmes de renoncement au tabac sur la seule base des taux de rechute. Pour améliorer le maintien à long terme de l'abstinence, ces programmes devraient donc faciliter la reprise du traitement et culpabiliser le moins possible les participants.

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