DETERMINANTS OF OUTCOME AMONG SMOKERS IN A SMOKING CESSATION PROGRAM

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مقدمة : يعتبر التدخين من أخطر مشاكل سوء استخدام العقاقير في العالم ، والتي تهتم بها القطاعات الصحية ضمن الثورة الهائلة في برامج تحسين وتطوير الخدمات الصحية .

هدف البحث : هذه الدراسة تسلط الضوء على الجوانب النفسية والاجتماعية والسلوكية للمدخنين التي تؤثر في برامج الاقلاع عن التدخين .

طريقة البحث : شملت الدراسة ٣٢٦ مدخن من مراجعي مركز مكافحة التدخين بمستشفى الملك فهد التخصصي ببريدة بالمملكة العربية السعودية ، تم استبيانهم لمعرفة أسباب التدخين ودوافع الاقلاع عن التدخين ومعرفة المفاهيم والمعتقدات لديهم عن الاقلاع، ثم ألحقوا بالبرنامج المتبع عن التدخين بالمركز ، وتمت متابعتهم بعد ٦ شهور لتقييم مدى نجاح البرنامج وذلك بقياس نسبة المنتكسين .

نتائج البحث : أظهرت النتائج أن أهم العوامل النفسية والاجتماعية لدى المدخنين التي تؤثر في عملية الاقلاع عن التدخين هي :

- وجود محاولات سابقة للتوقف عن التدخين .
- معاناة المدخن من التوتر والقلق والغضب .
- مفهوم المدخن عن تأثير التدخين على الصحة .
- مفهوم المدخن عن أهمية الاقلاع عن التدخين .
- مدة التدخين السابقة .
- مدة آخر محاولة للاقلاع عن التدخين وكيفية الاقلاع .

ولذلك فإن وضع هذه العوامل في الاعتبار عند مساعدة المدخنين يزيد من فرص نجاح اقلاعهم عن التدخين .

الكلمات المرجعية : التدخين – أسباب – دوافع – معتقدات – توقف .

***Background**: Tobacco consumption is now one of the most serious problems in the world and is receiving renewed attention in the current health promotion.*

***Objectives**: This study was carried out to elucidate the psychosocial and behavioural aspects of smokers associated with participation, attrition and outcome in smoking cessation programs.*

***Methodology**: This prospective cohort design included three hundred and twenty six smokers from the antismoking center - King Fahd Specialist Hospital, Buraydah, Kingdom of Saudi Arabia. The selected patients were subjected to a history taking, the assessment of: causes of smoking, motives for quitting and belief problems arising from quitting; then they were made to join the clinic's antismoking program and were followed up after six*

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months to assess the success of the program, which was measured by the rate of recidivism.

Results and conclusion: *The results showed that the important psychosocial and behavioural factors affecting the success in quitting smoking were: previous history of an attempt to stop tension, anxiety, anger, health beliefs and attitudes, importance of quitting, duration of smoking, period of last attempt to stop and the method used. These factors can be modified in order to increase the likelihood of success in quitting smoking.*

Key Words: *Smoking, Causes, Quitting, Beliefs, Cessation, Outcome.*

INTRODUCTION

Tobacco consumption is now one of the most serious problems in the world.[1] Present data suggest that although cigarette consumption is falling in Western countries, there was a global increase in consumption of 7.1% between 1970 and 1985, most of this in the developing world.[2] People in third world countries now consume between one third and one half of the world's tobacco.[3] Tobacco is imported into Saudi Arabia and the statistics from the Chamber of Commerce show an unbelievable increase of tobacco imports from 4.6 million kg in 1972 to 42 million kg in 1984. In 1984, Saudi Arabia was the world's third leading importer of US made cigarettes, but since then the increase in the importation of tobacco has remained modest.[4]

Although about 30% of smokers report an attempt to quit each year,[5] over 80% of smokers have made at least one attempt to stop smoking,[6] and often come to primary care physicians for advice. World Health Organization (WHO) data show that cigarette smoking is now the major preventable health hazard throughout the world,[2] and numerous studies have shown that physicians can change patients' smoking habits. The primary care physician must have the expertise to motivate patients to quit, and advise them on the best means to accomplish their goal. This requires knowledge about available smoking cessation techniques, an appreciation of how and when to use them and the factors which influence the outcome of attempts to stop smoking.[7]

As smoking receives renewed attention in the current universal health promotion, this study was designed to throw more light on the psychosocial and behavioral aspects of smokers associated with participation, attrition and the outcome of smoking cessation programs.

SUBJECTS AND METHODS

The study was carried out on 326 smokers. They were selected by systemic random sampling, alternately, from patients as they arrived on their initial visit to enroll at the antismoking center, King Fahd Specialist Hospital, Buraydah, Kingdom of Saudi Arabia, during the period of October 1994 to September 1995. Those selected were interviewed by the investigators, utilizing the United States Preventive Medicine Institute/Strang Clinic Health Action Plan, "How to stop smoking", which had been designed to assess the smoker's personal history, the reasons for smoking, the reasons for wanting to quit and the belief problems which the smoker may face as he alters his smoking habits in the process of quitting.[8] In addition, the questionnaire translated into Arabic had been modified to contain some demographic characters pertinent to the smoker. These included age, marital

status, literacy level, place of residence and occupation.

The questionnaire addressed three aspects:

1. Why do you smoke? A check list of 18 items with a score range of 1-5 for each. This section consisted of a number of statements made by people who were asked to describe their feelings about smoking cigarettes. The responses were grouped and summed up to assess their feelings about smoking cigarettes (stimulation - handling - pleasurable feeling - tension reduction, anxiety and anger - craving and psychological addiction - habit).

2. Do you really want to give up your smoking habit? This was a self - rating scale containing 12 items designed to measure the importance to the smoker of each of four primary motives for wanting to give up the habit. The responses were grouped and summed up to yield the primary reasons for wanting to give up smoking (Health - Example - Aesthetics and self control).

3. Beliefs affecting smoking cessation: This section consisted of 12 statements, to which the smoker's responses were grouped and summed up to address belief problems which the smoker may face as he altered his smoking habit (importance of quitting - personal relevance - value of stopping - capability of stopping).

After the interview, each participant then joined the clinic's program, which was of two weeks duration, with a follow-up period for six months.

Holbrook[9] stated that a non-smoking maintenance program was helpful in combating recidivism, which usually occurred within 90 days of quitting. This was the criterion for success adopted in this study.

After six months, the participants were followed up by the investigators to assess the success of the program which was measured by the rate of recidivism.

Statistical analysis was done using the SPSS/win V-5 statistical package.[10] Continuous variables were compared using Student t-test. Categorical variables were compared by means of cross-tabulation tables and X_2 statistic. Multiple logistic regression analysis technique[11] was used to examine predictors for quitting in the group of smokers tracked over the course of the study.

RESULTS AND DISCUSSION

Many studies have attempted to identify factors predicting success in the attempt to stop smoking. Results have often been conflicting, largely on account of the wide range of methodological approaches adopted and also due to the widely different criteria adopted to measure success in smoking cessation. Retrospective studies are subject to distortions of memory and the effects of rationalization, while prospective studies may influence the behavior of the smokers under study and are subject to unreliable self-reporting of smoking status, particularly if no validation measures are used. Most prospective studies use populations from smoking cessation clinics, and the particular methods used in the program may confound the effects of the individual characteristics being investigated. Variations in study populations, outcome criteria, how the factors under study function and statistical techniques all contribute to the difficulty of interpreting and comparing results. However, it is possible to draw some general conclusions.[12]

In this study, it was found that 38.3% of the studied sample was successful in giving up smoking (Quitters), while the rest (61.7%), continued to smoke (continuers).

Table 1: The relationship between the outcome of smoking cessation and some demographic factors.†

Characteristics	Studied Group: Quitters (n = 125)	Continuers (n = 201)	Statistic	P value
Age (year)	22.98 ± 5.66	27.07 ± 9.33	t = 4.92	< 0.001
Nationality:				
Saudi	103 (82.4)	148 (73.6)	$X^2 = 3.35$	> 0.05
Non-Saudi	22 (17.6)	53 (26.4)		
Marital Status:				
Single	85 (68.0)	123 (61.2)		
Married	37 (29.6)	75 (37.3)	$X^2 = 2.24$	> 0.05
Divorced/Widowed	3 (2.4)	3 (1.5)		
Education:				
Literate	118 (94.4)	156 (77.6)	$X^2 = 16.20$	< 0.001
Illiterate	7 (5.6)	45 (22.4)		
Residence:				
Urban	13 (10.4)	29 (14.4)	$X^2 = 1.11$	> 0.05
Rural	112 (89.6)	172 (85.6)		
Occupation:				
Medical Workers	11 (8.8)	16 (8.0)		
Police & Army	5 (4.0)	19 (9.5)		
Managers, officials, sales	18 (14.4)	37 (18.4)	$X^2 = 5.64$	> 0.05
Clerical kindered	12 (9.6)	23 (11.4)		
Unemployed‡	79 (63.2)	106 (52.7)		

† Quantitative data are given as mean ± SD, Categorical data as No (%)
‡ Most of them are students.

Table 2: Responses to quitting smoking program in relation to smoking history.†

Variable	Studied Group: Quitters n = 125	Continuers n = 201	Statistic	P value
Age at beginning of smoking (Yr)	15.79 ± 3.83	16.00 ± 3.86	t = 0.46	> 0.05
Duration of smoking (Yr)	7.09 ± 4.65	10.95 ± 8.71	t = 5.21	< 0.001
Amount of smoking (Cig./day)	19.52 ± 10.51	24.35 ± 13.58	t = 3.60	< 0.001
Place of smoking:				
More in home	35 (28.0)	66 (32.8)		
More in work	27 (21.6)	59 (29.4)	$X^2 = 5.20$	> 0.05
More in others	63 (50.4)	76 (37.8)		
Past history of stopping trial (No.)				
0 trial	5 (4.0)	105 (52.2)		
1 trial	44 (35.2)	59 (29.4)	$X^2 = 95.32$	< 0.001
2 trials	38 (30.4)	23 (11.4)		
3 or more trials	38 (30.4)	14 (7.0)		
Period of last stopping:‡				
< 3 months	78 (65.0)	79 (82.3)		
3 - 12 months	21 (17.5)	8 (8.3)	$X^2 = 8.07$	< 0.05
> 12 months	21 (17.5)	9 (9.4)		
Method used in stopping:‡				
Cut down	86 (71.7)	51 (53.1)		
Cold turkey	18 (15.0)	29 (30.2)	$X^2 = 8.96$	< 0.05
Switched brands	16 (13.3)	16 (16.7)		

† Quantitative data are given as mean ± SD, categorical data as No (%)
‡ For those who have past history of stopping trial

Table 1 clearly shows that the mean age of the continuer group was higher than that of the quitters (27.07 ± 9.33 years & 22.98 ± 5.66 years respectively), the difference being statistically significant ($P < 0.001$). These findings had been confirmed by some investigators who reported that the chances of success in any attempt decreased as the age increased.[13-16] On the other hand, several studies indicated that age had no effect on the outcome of cessation attempts.[17-20]

A study of the marital status revealed that unmarried patients constituted 68.0% of the quitters and 61.2% of the continuers, while 29.6% of quitters and 37.3% of the continuers were married and only 2.4% and 1.5% of the quitters and continuers respectively were either widowed or divorced (Table 1). The differences between these groups were not statistically significant. These findings are at variance with those of a number of researchers[21-23] showing that marriage was an indicator of a favourable outcome in smoking cessation.

With regards to the distribution of nationality and residence, the present study showed no significant difference between quitters and continuers (Table 1).

The relationship between the outcome of the smoking cessation program and the level of education has been investigated. Of the quitters, 94.4% were literate compared with 77.6% of the continuers, the difference being statistically significant (Table 1). Similar findings have been observed in several studies;[22,24,25] these concluded that there was a relationship between the level of education and success in quitting smoking; and that the rate of success had been highest among the better educated.[26]

Both studied groups began smoking at a young age (15.79 ± 3.83 years for quitters and 16.00 ± 3.86 years for continuers). The difference was not statistically significant (Table 2). Hammam et al reported that 77.7% of the students who smoked, started to smoke in adolescence, and 20.9% began smoking at the age of 20 years or more, while those who started smoking in childhood constituted only 1.4% of smokers.[27] Also, Escobedo et al stated that among all race/ethnic groups, initiation to smoking occurred as early as 9 years of age, then smoking increased rapidly after 11 years of age, peaking at 17 to 19 years and then declining substantially after 19 years.[28] These findings may be useful in planning and implementing smoking prevention programs targeting the youth, some of whom have been successful in quitting.[29,30] The data emphasize the need for smoking prevention education beginning at an early age, particularly among persons of low socio-economic status.[28]

A study of the effect of duration of smoking on the outcome of smoking cessation program revealed that, the continuers had smoked for longer periods than had the quitters (10.95 ± 8.71 years and 7.09 ± 4.65 years respectively), the difference between the two groups being statistically significant (Table 2). This finding was confirmed by a number of studies which demonstrated that the chances of success in any one cessation attempt decreased with the length of time spent as a smoker.[22,23,31] Moreover, the heavier smoker found it more difficult to stop smoking; continuers smoked more cigarettes per day than did quitters (Table 2). Similar results were observed in several studies which concluded that light smokers were more successful in quitting than heavier smokers.[7,13,16,21,31-34]

Table 2 clearly shows that smokers who repeatedly try to quit increase their likelihood of success, 96% of the quitters have a past history of an attempt to stop compared to 47.8% of the continuers, while

30.4% of the quitters have had repeated attempts (3 or more) compared to 7% of the continuers. These differences between the two groups were highly significant (P<0.001). Our results agree with Rigotti who suggested that a high expectation of success was associated with positive previous cessation experiences.[7]

A significant association existed between the period of last stopping trial and the rate of quitting success (Table 2). Of the quitters, 35% had stopped smoking for 3 months or longer compared to 17.7% of the continuers, while 65% of the quitters had stopped for period of less than 3 months compared to 82.3% of the continuers. Similar findings have been observed in several studies.[17,19,20,31,35] These concluded that the longer the period of abstinence in pervious cessation attempts the better the chance of success in subsequent attempts. As regards the place of smoking, there were no significant differences between the two groups studied (Table 2).

A cut down method of quitting was more commonly used by quitters in the previous attempts than continuers (Table 2). These results are in accordance with Rigotti, Condiottet and WHO, who reported that smokers who quit using the "cold turkey" approach were more likely to remain abstinent than those who tapered.[7,36,37] Some reduction in cigarette consumption and a change to a different brand can be part of a smoker's preparation for quitting - being specially helpful in building a sense of confidence and control - but is no substitute for setting a definite date for abrupt and total cessation.[7,36,37]

A study of the relationship between the causes of smoking and the outcome of the program for quitting was studied. The continuers showed highly significant scores for reducing tension, anxiety, anger and craving & psychological addiction (12.35 ± 2.91 & 10.66 ± 3.07 respectively) compared to quitters. On the other hand, scores for stimulation, handling, pleasurable feeling and habit showed no significant differences between the two groups (Table 3). Smoking is a complex behavior initiated and maintained for different reasons. The influence of peers and parents appears to be most important in the initiation of smoking. Both pharmacological and psychological models have been proposed to explain what maintains smoking behavior. Smokers use cigarettes to handle environmental stress and regulate emotions, especially native emotions like anger.[7,38,39] A strong association between depression and smoking has been documented. Depressed patients are more likely to be smokers, and less likely to attempt quitting or succeed at quitting.[40,41] The evidence for smoking as an addictive behaviour is strong, and nicotine has been established as the addicting substance in tobacco smoke. According to this, the smoker smokes to maintain a constant blood level of nicotine. This pharmacological model can explain initial difficulties with cessation.[42-44]

When we consider the motives for quitting smoking, it is evident that the mean values for health, for example, aesthetics and self-control scores were significantly higher among quitters than continuers (Table 4). Health beliefs and attitudes were given as the most common reasons by former smokers for quitting.[7,45,46] However, the evidence for the effect of health beliefs on smoking behavior is conflicting. The study by Pederson and colleagues,[21] of patients with respiratory disease showed that beliefs on smoking and health did not influence smoking behavior. Richmond and colleagues[34] reached the same conclusion in a study of general practice intervention. Belief in personal vulnerability to smoking related disease was shown to predict participation, but not outcome, in a stop-

Table 3: Mean scores of causes of smoking among the studied groups

Cause of smoking	Studied Group		t-test	P - value
	Quitters (n=125) X ± SD	Continuers (n=201) X ± SD		
Stimulation	7.55 ± 3.14	7.99 ± 3.09	1.24	> 0.05
Handling	9.19 ± 3.55	8.96 ± 3.39	0.60	> 0.05
Pleasurable feeling	10.29 ± 3.15	10.00 ± 3.37	0.77	> 0.05
Reducing tension, anxiety, anger	8.75 ± 2.49	12.35 ± 2.91	11.48	< 0.001
Craving and psychological addiction	8.53 ± 2.64	10.66 ± 3.07	6.42	< 0.001
Habit	7.54 ± 3.25	7.61 ± 3.23	0.19	> 0.05

Table 4: Mean scores of causes of quitting smoking among studied groups

Cause of quitting	Studied Group		t-test	P - value
	Quitters (n=125) X ± SD	Continuers (n=201) X ± SD		
Health	11.59 ± 0.98	9.44 ± 3.12	9.07	< 0.001
Example	10.54 ± 1.72	9.56 ± 2.59	4.08	< 0.001
Aesthetics	11.20 ± 1.35	9.85 ± 2.64	6.08	< 0.001
Self-control	9.84 ± 1.72	9.12 ± 2.27	3.02	< 0.01

Table 5: Mean scoring values of belief problems affecting quitting smoking among the examined groups

Belief in quitting smoking	Studied Group		t-test	P - value
	Quitters (n=125) X ± SD	Continuers (n=201) X ± SD		
Importance of quitting	9.82 ± 1.98	7.72 ± 2.95	7.69	< 0.001
Personal relevance	9.35 ± 1.98	7.71 ± 2.75	6.25	< 0.001
Value of stopping	10.63 ± 1.65	8.95 ± 2.78	6.84	< 0.001
Capability of stopping	8.10 ± 2.37	6.95 ± 2.48	4.18	< 0.001

smoking program.[33] Conversely, Eisiger[14,32] showed that stopping because of a desire to improve one's health or because the health of a relative had suffered from smoking, predicted a good outcome.

Other reasons for quitting cited by former smokers include a desire to exert self-control over one's life, aesthetic objections to the smoking habit and fear of setting a bad example to others.[7,47]

In a study of the belief problems which smokers may face in quitting smoking, our results (Table 5) revealed a highly significant association between the success in smoking cessation and the mean scores for importance of quitting, personal relevance, value of stopping and capability of stopping (P < 0.001).

Table 6: Stepwise logistic regression analysis of different variables in relation to outcome in smoking cessation

Variables	X^2	P - value
Past history of stopping trial	111.4	< 0.001
Tension, anxiety & anger	202.9	< 0.001
Health beliefs & attitudes	243.3	< 0.001
Importance of quitting	260.9	< 0.001
Duration of smoking	273.2	< 0.001
Period of last stopping trial	277.5	< 0.001
Method used in quitting	280.7	< 0.001
Nationality	281.2	< 0.001

The relative importance of the possible characteristics in relation to the successful outcome of a smoking cessation program

was calculated using conditional stepwise logistic regression technique in a forward manner by adding all studied variables one at a time and taking into consideration the success in quitting smoking as the dependent variable in the regression equation. This multiple logistic regression analysis showed that the effective subject characteristics affecting the success in quitting smoking were: past history of stopping trials - tension, anxiety and anger - health - importance of quitting - duration of smoking - period of last stopping attempt - method used in quitting - nationality (Table 6).

It is concluded that many characteristics influence an individual's chances of success in stopping smoking and that many of these characteristics can be modified so as to increase the likelihood of success.

Accordingly, the assessment of patient's individual characteristics would allow physicians to target their efforts both on patients for whom the attempt to stop smoking is likely to be particularly difficult and on patients most likely to succeed.

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