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Does Change in Perception Following Counseling Result in Improved Quitting Outcome Among Malaysian Smokers?

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Abstract

Objective: The authors examined the effects that change in perception about the advantages and disadvantages of smoking and quitting had on quitting outcome among smokers enrolled in a program for smoking cessation. *Methods:* A total of 185 smokers from 2 public universities who were interested in quitting received smoking cessation counseling on understanding the risks and benefits of quitting (or smoking) in addition to a course of free nicotine replacement therapy (NRT). A decisional balance questionnaire (DBQ) was administered at baseline and at 2 months postcounseling to determine and assess changes in smoking perception. *Results:* After counseling, 72.3% of smokers had reduced their perceptions about the advantages of smoking, and 66.4% had increased perceptions of disadvantages of smoking. At the eighth week, 51 participants (27%) had quit. Smokers who had reduced perceptions of the advantages of smoking had significantly higher quit rates compared with those with no improvement in perception (82.6% vs 17.4%; odds ratio = 2.47; 95% confidence interval = 1.00-6.10). *Conclusion:* After counseling, smokers did change their perception of the advantages and disadvantages of smoking during the quitting process. These changes are associated with a higher likelihood of smoking cessation.

Keywords

smoking cessation, counseling, decisional balance, perception, Malaysian

Introduction

Tobacco is considered the single most preventable cause of premature morbidity and mortality. It is a major cause of lung cancer, cardiovascular diseases, chronic obstructive pulmonary diseases

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(COPD), and other chronic diseases, resulting in 5 million deaths annually.[1] When patients quit smoking, risks of new cardiac events and diseases decline substantially.[2]

According to Malaysia's Third National Health Morbidity Survey (NHMS III) in 2006, the prevalence of smoking in adults aged 18 years and above was 21.5%. Among men, the prevalence was 46.4%.[3] It is also becoming an increasing problem among adolescents in Malaysia and neighboring countries.[4,5] Despite various efforts to reduce the number of smokers in the country, including the introduction of smoking cessation services/clinics, there was only a 2% reduction in adult smokers from what was reported in a similar survey 10 years ago (23.5% prevalence).[6] This suggested that national efforts to reduce smoking were not very successful.[6-9]

For effective smoking cessation outcomes, health care professionals should have structured counseling sessions. Besides using the well-known 5 As method, which consists of "ask and advice the smokers, assess their willingness to quit, assist in quitting efforts, and arrange a close follow-up,"[10,11] they need to equip patients with adequate knowledge and awareness before beginning the quit attempt. The Agency for Healthcare Research and Quality had suggested that health care professionals should advise patients on the negative consequences of continuing smoking (eg, heart disease, stroke, and lung disorders) and highlight the benefits of smoking cessation (eg, improved health and feeling better about oneself) to help motivate smokers.[12]

Various conceptual models suggest that many factors influence smoking cessation.[13] For smoking cessation to occur, an individual must first perceive personal vulnerability to its negative outcomes.[14] They must understand that the outcome would be severe, and quitting would reduce the likelihood of their personal susceptibility. Furthermore, it has been argued that smokers tend to acknowledge the risks of smoking generalized to other smokers but fail to fully link it to their own vulnerability.[15]

Previous studies have shown that a smoker's perception of the advantages and disadvantages (pros and cons) of smoking is associated with motivation.[16] Only 2 published studies thus far have shown that decisional balance (DB, consisting of pros and cons of smoking) can be used to predict future outcome. The first study was by Velicer and associates,[17] and the second was a recent study among a group of adult smokers in Germany.[18] They suggested that targeting the smoker's perceptions on the pros and cons of smoking (or quitting) may increase smoking cessation rates in any cessation program.

To date, little attention has been given to study changes in perception that may occur after receiving appropriate counseling. In addition, we do not know whether the changes actually improve cessation outcome, especially among south-east Asian smokers.

Therefore, our study aims to explore the (1) differences in initial perceived advantages and disadvantages of smoking across sociodemographic backgrounds, (2) changes in the perception of the pros and cons of smoking after going through a behavior treatment program, and (3) changes in behavior and its relation to smoking cessation outcome at 2 months among adult Malaysian smokers enrolled in a quit smoking program.

Methods

Participant Recruitment

This was a prospective cohort study, conducted from November 2009 to April 2010. Staff from 2 public universities in the Klang Valley in Malaysia were recruited. The study was approved by the medical ethics committees of the universities, and informed consent was obtained from all participants.

This study used convenience sampling, where smokers from both universities who were interested in quitting were invited to enroll. Various invitation methods were used, including staff

portal, staff e-mail, posters, main university Web sites, and invitation letters through the heads of departments/units. Eligible participants were daily cigarette smokers (for at least the past 12 months). They had to be able to communicate in either Bahasa Malaysia (the national language) or English.

Participants were excluded if they had any contraindications to nicotine replacement therapy (NRT), such as a recent myocardial infarction, life-threatening arrhythmias, severe or worsening angina, or an allergy to any component of the medication.

Smoking Cessation Program

All sessions were conducted during office hours by a medical doctor and an assistant. During the first clinic appointment, the participants completed a decisional balance questionnaire (DBQ; measuring the pros and cons of smoking) as well as smoking history questionnaires prior to the counseling session.

Subsequently, all participants were given 45 minutes of intensive group teaching, involving a power point presentation and discussion in small groups of 4 to 5 individuals. This educational session covered (1) the epidemiology and pathophysiology of smoking; (2) understanding the benefits and risks of continuing to smoke; (3) the risks and impact of first-hand and second-hand smoking on self, family, and the environment; and (4) the benefits of quitting. The teaching sessions were based on the current recommended US Clinical Practice Guidelines,[12] with greater emphasis on understanding the risks and benefits of smoking and quitting. Participants were also taught about how to set a quit date in addition to the use of NRT. The participants were given appropriate NRT gums for a period of 1 month.

The second session, held 2 to 3 weeks later, consisted of a 5- to 10-minute individual counseling session with the medical officer, which explored their quitting concerns, adherence to NRT, and other associated problems.

At the eighth week, a second set of the same questionnaire (DBQ) was mailed using internal mail (university mailing system) to the participants. Those who failed to return the questionnaire after 2 weeks were contacted by telephone to determine their smoking status. Systematic reviews have confirmed that for low-intensity interventions, biochemical validation is probably unnecessary.[19]

Data Collection

Baseline measures. The participant's sociodemographic history and smoking history were assessed. This included information such as age group, ethnic group, educational attainment, occupational group, and marital status. Smoking history variables were number of cigarettes per day, age of commencement of smoking, previous quit attempt, and NRT.

Decisional Balance Questionnaire

This questionnaire is part of the Transtheoretical Model (TTM) by Prochaska, which has been widely used.[17] It was popularized and validated by Velicer and associates[20] to involve both smoking cessation and relapse situations. This model consists of 3 parts, which are (1) smoking DB, (2) temptations to smoke, and (3) impacts of smoking (processes of change).

DB, a part of the TTM, contains 2 independent factors (pros and cons), which estimated the importance of making a behavior change as perceived by individuals.[21] The DBQ used in this study is a short form measure of the original 24-item scale.[22] It examines the smoker's perception of the pros and cons of smoking in 3 subscales. The pros are (1) smoking makes me feel more

relaxed and pleasant, (2) smoking helps me concentrate and do better work, (3) smoking relieves tension. The cons are (1) I am embarrassed to have to smoke, (2) my cigarette smoking bothers other people, and (3) my cigarette smoking affects my long-term health. The average item scores were used as a scale score for the DBQ.

For these 2 items (pros and cons of smoking), scale scores were computed by taking the mean score of each item, respectively. The pros and cons of smoking were measured on a 5-item subscale. Each participant was asked to rate the importance of each item based on their decision to quit or continue smoking, using a 5-point Likert scale (1 = *not important*, 2 = *least important*, 3 = *important*, 4 = *very important*, and 5 = *extremely important*). Prior to administration, the questionnaire was properly back translated to Bahasa Malaysia language by 3 independent language translaters, from whom common consensus was sought. The items were then pretested for appropriate translation and vocabulary.[23] Subsequently, a reliability test was conducted in a group of 40 smokers. The DBQ revealed an acceptable Cronbach's α of between .69 and .92 and correlations of between 0.76 and 0.84.

Statistical Analysis

In the first part of the analysis, we evaluated differences in the pros and cons of precounseling using a χ^2 test for categorical variables and *t* test or ANOVA for continuous variables against the sociodemographic characteristics and smoking history.

We examined DB (first and second) against cessation outcome using paired *t* tests and changes in DB proportion using a χ^2 test and Cochran's and Mantel Haenszel statistics. Smokers who failed to answer the second DBQ at 2 months were excluded.

The point prevalence quit rate was defined as self-reports of not smoking during the past 7 days (obtained at a 2-month telephone interview). Smoking status at initial visit was confirmed by a CO ppm measurement (using a Bradfort CO analyzer) of <10 ppm. Results at 2 months were reported without any biochemical validation. We used intention-to-treat analysis in assessing quit rates. In this analysis, those who could not be contacted (refused, changed phone number, cannot be contacted, or intentionally gave the wrong telephone numbers) were considered to have continued smoking.

Those who were using NRT daily for at least 2 weeks, as evidenced from the quit smoking diary, were defined as adherent to NRT. Those who refused or took NRT for less than 2 weeks were considered as not adherent to NRT. All data were analyzed using SPSS 15.0 (SPSS Inc, Chicago, IL), and the significance level was preset at .05.

Results

There were 138 and 47 respondents from University A and University B, respectively. All 185 participants answered the baseline questionnaire. The response rate for the second mailed DBQ was 64% (n = 119). There was no significant difference ($P > .05$) in response rate between the 2 universities (67% university A and 57% for University B).

Participant Characteristics

On average, participants reported that they started smoking at the mean age of 17 (range, 9-42) years. The average number of cigarettes smoked per day was 14 (range, 2-40; Table 1). The mean CO ppm value during the first visit was 15.5 ppm. Sociodemographic background and smoking characteristics of participants in the 2 public universities were similar (all $P > .05$).

Table 1. Sociodemographic and Smoking Characteristics

Sociodemographic and Smoking Characteristics	n (%)
Sociodemographic characteristics	
Age group (years)	77 (41.6)
18-29	
30-40	43 (23.2)
41-50	43 (23.2)
51 above	22 (11.9)
Ethnic group	
Malay	176 (95.1)
Non-Malay	9 (4.9)
Highest education achievement	
Primary school	5 (2)
Secondary school	107 (58)
Diploma and above	73 (40)
Occupational status	
Support group	171 (93.4)
Professionals	14 (6.6)
Marital status	
Single	69 (37.3)
Married	113 (61.1)
Divorced	3 (1.6)
Smoking history	
Number of cigarettes/d	
<10	27 (14.6)
≥10	158 (85.4)
Age started smoking (years)	
8-12	18 (9.7)
13-18	121 (65.4)
19 And above	46 (24.9)
Previous quit attempt	
0	27 (14.6)
≥1	158 (85.4)
Nicotine replacement therapy used	
Nonadherent	109 (58.9)
Adherent	76 (41.1)

Perceived Advantages and Disadvantages of Smoking by Different Sociodemographic Backgrounds

Overall, participants scored higher in recognizing the cons of smoking as compared with the pros of smoking. Participants did not differ in initial perception across all sociodemographic and smoking history variables (all $P > .05$). Smokers in the professional group had higher mean scores for the cons of smoking compared with the support staff ($P = .06$). Similarly, smokers with higher education levels perceived the advantage of continuing smoking (pros) to be lower than smokers with lower education levels ($P = .07$). Married smokers also perceived the disadvantages of smoking (cons) to be higher than unmarried smokers ($P = .08$).

Table 2. Change in DBQ Postcounseling Among Quitters and Nonquitters

	Quitters, n (%)[a]	Nonquitters, n (%)[a]	OR (95% CI)	*P*
Pros of smoking (postcounseling compared with precounseling)				
Reduced score	38 (82.6)	48 (65.8)	2.47 (1.00-6.00)	.04
No changes/increased score	8 (17.4)	25 (34.2)		
Cons of smoking (postcounseling compared with precounseling)				
Increased score	31 (67.4)	48 (65.8)	1.07 (0.49-2.36)	.50
No changes/reduced score	15 (32.6)	25 (34.2)		

Abbreviations: DBQ, decisional balance questionnaire; OR, odds ratio; CI, confidence interval.
[a]Quit status at 2 months after treatment.

Changes in Perception After Going Through the Treatment Program

Overall change in pros and cons of smoking at initial follow-up and at 2 months were analyzed using paired *t* tests. Results showed a significant difference between precounseling and postcounseling scores.

The mean difference for overall pros of smoking was lower after counseling 0.53 (95% confidence interval [CI] = 0.36, 0.71), whereas the mean difference for overall cons of smoking was significantly higher −0.18 (95%CI = −0.33, −0.02). in all, 86 out of 119 (72.2%) participants had reduced scores for the pros of smoking, whereas 79 out of 110 (66.3%) participants had increased scores for the cons of smoking.

Changes in Behavior and Its Relation to Smoking Cessation Outcome

After 8 weeks, 51 participants (27%) claimed to have given up smoking. Using an intention-to-treat approach, 10 participants whose smoking statuses were undetermined (unable to be contacted via telephone) at 2 months were classified as smokers.

In all, 76 participants (41.1%) did not adhere to NRT either because of intolerable side effects or defaulted follow-up. Those who adhered to NRT in comparison to those who were nonadherent had significantly higher success rates after 2 months (odds ratio = 2.34; 95% CI = 1.35-3.32).

We analyzed the change DB precounseling and postcounseling and compared it with our success rates. Table 2 shows the change in pros and cons of smoking in the participants, classified into 2 categories: (1) participants with reduced score in the pros and increased scores in the cons and (2) those with no change in DB. Among participants with reduced pros of smoking, 38/86 (44%) had quit, whereas 8/33 (24%) participants with no change had quit. For those who had changed perception in cons of smoking postcounseling, 31/79 (39%) had quit, compared with 15/40 (37%) participants who had no change in perception in cons and who quit.

The smokers with reduced scores for pros of smoking were more likely to quit. Although quitters also had changed their perception on the disadvantages of smoking (cons), the change was not significant when compared with those who did not quit. Paired pros and cons of smoking (precounseling and postcounseling) were analyzed separately between the quitters and the nonquitters (Table 3).

Quitters showed significant changes in their perceived pros and cons of smoking after counseling. As for nonquitters, there was a significant reduction only in the pros of smoking but no

Table 3. Change in Pros and Cons by Smoking Status at 2 Months After Treatment

	0 Months, Mean (SD)	2 Months, Mean (SD)	Mean Difference (95% CI)	*P*
Quitters (n = 46)				
Pros of smoking	3.05	2.31	0.74 (0.44, 1.03)	<.01
Cons of smoking	3.70	3.96	–0.26 (–0.51, –0.00)	.05
Nonquitters (n = 73)				
Pros of smoking	3.19	2.81	0. 37 (0.16, 0.59)	<.01
Cons of smoking	3.55	3.68	–0.13 (0.33, 0.07)	.19

Abbreviations: SD, standard deviation; CI, confidence interval.

significant difference in the perceived cons of smoking. When we compared the answers given by both groups, we found no significant difference in perception among quitters and nonquitters at baseline in their perceived pros and cons of smoking. However, at 2 months, after going through an educational session, quitters answered with higher scores for the cons of smoking and lower scores for the pros of smoking (Table 4).

Discussion

This is one of the first studies to examine the changes in smoking-related perceptions after an intensive smoking cessation treatment. In this study, all smokers scored more than 3 in the cons of smoking. This showed that smokers were aware of the disadvantages of continuing smoking.

Our results showed that among smokers who were interested in quitting, their initial perception did not vary with education level, occupational status, marital status, ethnicity, and age group. Although the highly educated and professional groups were more aware of the dangers of continuing smoking compared with the lower educated and support group, the difference was not statistically significant. A recent local study in a larger sample found supportive evidence that knowledge of smoking-related effects increased across educational level.[24] This was similar to findings in other international studies.[25,26]

DB involves weighing the importance of a set of positive and negative aspects before engaging in a particular behavior.[27] Cross-sectional studies have shown that the cons of smoking increased linearly from the precontemplation to the action stage (patient thinking about quitting until engaging in quit attempt), whereas the pros of smoking dropped significantly from the precontemplation to the contemplation (before thinking of quitting until contemplating quitting) stage but increased again once it reached the action stage (quitters less than 6 months).[28] However, when it was examined across time, the results differed. In a longitudinal study among self-initiated smokers, results have shown that cons differed significantly between precontemplation and contemplation, and from contemplation to preparation but not pros. There was no significant difference observed in the pros of smoking in the 3 stages.[29]

In our prospective study, we extended our results to the action stage. The majority of smokers in our study were in the contemplation and preparation stage at entrance into this study, whereas 27% had entered the action stage by the end of 2 months. Our results showed that smokers had actually changed their perceptions on both the pros and cons of smoking postcounseling. Perceptions of the pros of smoking were reduced, whereas that of the cons of smoking increased

Table 4. Paired Difference in Pros and Cons of Quitting at 0 and 2 Months, by Quitting Status

	Quit at 2 Months, n = 46, Mean (SD)	Did Not Quit at 2 Months, n = 73, Mean (SD)	Mean Difference (95% CI)	*P*
Precounseling				
Pros of smoking	3.10 (0.87)	3.12 (0.83)	−0.05 (−0.33, 0.22)	.71
Cons of smoking	3.73 (0.74)	3.63 (0.78)	0.12 (−0.12, 0.38)	.31
Postcounseling				
Pros of smoking	2.31 (0.87)	2.81 (0.87)	−0.50 (−0.82, −0.18)	.03
Cons of smoking	4.00 (0.78)	3.68 (0.81)	0.15 (0.02, 0.62)	.03

Abbreviations: SD, standard deviation; CI, confidence interval.

significantly. The difference observed can probably be attributed to increase in motivation after the educational and counseling sessions, which was however not measured in this study. In other words, this highlighted the fact that self-initiated smokers differed from smokers who were given extra external motivation.

Recently, changes in DB have increasingly been discussed in addictive behavior interventions. Among at-risk and heavy college drinkers, results showed that a brief discussion on the advantages and disadvantages of decreasing drinking managed to significantly change their drinking habit postcounseling.[30,31]

This observation has however not been explored very much in smoking cessation. A recent smoking cessation study found evidence that greater movement of DB change was associated with abstinence at up to 12 months of follow-up.[18] Another study among COPD patients also supported our findings. The study concluded that confrontational counseling was an important factor and mediator in alleviating risk perceptions and self-efficacy and in turn reduced self-risk denial.[32] Besides advising smokers on the benefits and risks of quitting, our comprehensive counseling was also meant to target these similar factors. As such, our results have shown that such counseling had increased risk and benefit perception. This change in perception is related to improved cessation outcome.

Understanding the nature and the relationship between smoking status and perceptions of smokers prior to the program and after the program has implications for further development of smoking cessation programs. Health education and promotion studies suggest that fear arousal alone may not be sufficient to change peoples' behavior. A combination of several approaches is more likely to result in a better outcome[33,34] and help smokers overcome their barriers to quitting and changing their perceptions of quitting. Smoking cessation programs should address not only the adverse effects of tobacco use but also the positive attitudes that individuals have about smoking.

There are several limitations to our study. The second part of our analysis was conducted with only a subset of participants who responded to both DBQs, which may limit generalizations of our study. Participants who did not return the questionnaire could be smokers with lower levels of educational attainment or errant smokers who gained least from the sessions.

A second limitation was that our smoking status at 2 months was based on self-report. Although we may have biochemical validation for a few smokers at 2 months who continued additional follow-up, most smokers would have completed treatment by 2 months, and it was difficult for them to obtain permission from their superiors to come to the clinic for CO ppm verification.

Our findings may indicate that improving the normal unstructured smoking counseling to focus on the pros and cons of quitting (or smoking) are associated with changes in cessation outcome. However, the best study design would be a randomized clinical trial. We were unable to conduct such a study because of poor participation from the second university and also because of lack of manpower. Finally, the duration of our study is limited to only 2 months. In future research, it may be of interest to examine this relationship over an extended period of time.

Despite these limitations, our study has a number of strengths, including a diverse study population of smokers with various educational backgrounds. There were no significant differences between participants from the 2 universities in terms of sociodemographic characteristics and outcome. The fact that the medical officer and materials were the same for both universities has reduced provider bias, which is an added advantage in this study. Furthermore, the small, group power point sessions were also a 2-way communication session where smokers exchanged ideas and worries about quitting. It was presented in such a way as to enable even the least educated to comprehend and understand the messages conveyed.

Conclusion

We conclude that in our population of smokers who wished to quit, their perceptions of the cons of smoking increased and the pros of smoking decreased after the intensive, small group intervention. These changes in perception were associated with a higher likelihood of smoking cessation after 2 months of treatment.

Recommendations

Future studies should address interventions with different approaches in behavioral therapy. Adding a separate component on educating smokers in depth on the risks and benefits of continuing smoking and quitting may be beneficial to improve the overall outcomes in smoking cessation programs. In this regard, this study goes another step in the development of future smoking cessation programs. It can potentially be applied to other developing countries in South East Asia and the region.

Declaration of Conflicting Interests

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