

The Effects of Smoking-Cessation Counseling Based on the Stages-of-Change Model in Dental Patients; Semi-Experimental Study

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Abstract

Background Dentists may take part in smoking cessation counseling of dental patients by using the time they are engaged in dental procedures and by emphasizing on oral manifestations of smoking. The present study aimed to evaluate the effects of smoking cessation counseling by a dentist on preparation for change to quit smoking in smoker patients. **Methods** This study was performed on 150 smoking patients admitted to Dental School of Shahid Beheshti University of Medical sciences, Tehran, Iran. The patients were randomly divided into two groups of 75 patients. The intervention group received smoking cessation counseling by a single senior dental student. A self-administered questionnaire containing questions regarding the position of the individual in change cycle stages was completed by both intervention and control group at baseline and at one-month follow up. For statistical analysis, paired t-tests, Mann-Whitney U and multivariate linear regression models was used with a significance level of $P < 0.05$. **Results** At baseline, there were no significant differences between the intervention and control groups in terms of change cycle stages of smoking cessation. Also, there was no significant difference between change cycle stages at baseline and one-month follow up in control group; but this difference in intervention group was significant ($p = 0.006$). The proportion of patients in the pre-contemplation stage decreased by 43% while the proportion of patients in the contemplation and action stages increased by 20% and 16% respectively. **Conclusions** The smoking cessation counseling enhances forward movement through the stages-of-change of smoking cessation. Measurement of this movement may be an important intermediary in evaluating small clinical trials of counseling.

Background

Smoking is one of the primary cause of morbidity and mortality in the world. Several studies have shown that patients who use tobacco are at risk of respiratory [1], cardiovascular and neoplastic diseases, as well as cancers of the head and neck regions, mucosal conditions, periodontal disease [2], failures of dental implants and halitosis [3]. Various methods have been used to encourage people to quit smoking. One of these methods is smoking cessation counseling by nurse, physician or dentist and social workers [4-6]; data regarding the useful effects of smoking cessation counseling have been encouraging and multiple studies have shown higher quit rates in counseled versus non-counseled smokers [7-10].

Oral health professionals in the dental settings have a unique opportunity to increase tobacco abstinence rates among tobacco users and helping them quit smoking [11-12]. The first and most basic step to smoking cessation counseling is identification and assessment of tobacco use in patients, in this regard most dentists or dental students identify patients who smoke, but due to a lack of knowledge about available organizations, and referral procedures, the majority of them provide no cessation intervention services [13-15]. A systematic review by Carr et al. Showed that interventions conducted by oral health professionals increased tobacco quitting rates at 12 months or longer, and proposed that further study of tobacco counselling within the dental office setting is important to identify effective intervention components for this profession [16].

On the other hand, despite the many studies on smoking cessation [17], there are only a few studies on evaluating the effect of dentist's smoking cessation counseling on smoker's situation in change cycle [18-19]. Since more than 50% of smokers visit dentists and dental clinics at least once a year, it can be a golden opportunity to promote cessation counselling by dentists [16].

It should be considered that people are in different stages of change behaviors before counselling, and the dentist should notice this difference in setting up the cessation counselling. Based on trans-theoretical model [TTM], people

are within one of the stages of change regarding preparedness to quit; pre-contemplation [no intention to change behavior, and unaware of problems], contemplation [Aware of the problem & seriously considering a change, but no commitment to take action], preparation [intention to change], action [actively making change], maintenance [continuing to stay on changed behavior] and relapse [going back to the previous behavior] [20-22]. The aim of this study was to investigate the effects of smoking-cessation counseling based on the stages-of-change model on patient knowledge about tobacco use and oral health effect and attitude towards quitting in a dental school setting.

Methods

This study was a semi-experimental and performed on the patient [undergoing different dental treatments] admitted to Dental School of Shahid Beheshti University of Medical sciences, Tehran, Iran. The participants were clarified about the aims of the study, and formal consent was obtained for participation. It was affirmed that contribution in the study is completely voluntary, respecting the confidentiality of the data. This study was approved by the Research Ethics Committee of Research Institute of Dental Sciences, Shahid Beheshti University of Medical Sciences.

Considering the level of significance of 95% and statistical power 80%, and with regard to the estimated 25% of moving frequency in cycle change in intervention group, 140 samples were determined to be sufficient. Due to the possibility of loss to follow up into consideration, 150 participants were chosen being randomly divided into two groups of intervention and control. Inclusion and exclusion criteria were as follows. Only “ever-smokers” patients as those who reported having smoked ≥ 100 cigarettes were recruited and the patients who refusing to respond to questions or having mental illness/ mental retardation were excluded.

We selected a specific implementation framework that fit with our specific aim. Our overall program is guided by transtheoretical model (TTM) of change, which construes behavior change as an intentional process that unfolds over time and involves progress through a series of six stages of change [21]. TTM integrates processes and principles of change from across leading theories, hence the name Transtheoretical.

A standardized questionnaire was used to evaluate the pre- and post-intervention status of the individual in stages of change along with their knowledge regarding smoking hazards and attitude towards smoking abstinence; the psychometric properties of the questionnaire has been published elsewhere [23].

The questionnaire consisted of demographic data (gender, age, marital status, income and education), questions about smoking condition (consumption of other types of tobacco products, type of cigarette, frequency, and age of starting smoking), a question about determination of change stages guided by TTM [pre-contemplation, contemplation, preparation, action, maintenance and relapse], six questions for evaluating the patient’s knowledge about the effects of smoking on their own health and others, and 21 questions evaluating the patient’s attitude about quitting smoking and role of the dentist in this regard.

All the patients were classified into either of the six change cycle stages according to the TTM: patients who did not want to quit smoking in the next six months (pre-contemplation), patients who were thinking to quit smoking in the next six months (contemplation), patients who had decided to quit smoking in the next 30 days (preparation), those who had actually quit smoking and been abstinent for less than six months (action), patients who have stopped smoking for more than six months (maintenance), and patients who had quitted but are smoking again (relapse).

Knowledge on tobacco use and oral health effect and attitude towards quitting questions were scored by five-level Likert scales ranging from strongly disagree (score 1) to strongly agree (score 5) as a secondary aim. The minimum knowledge score was six with a maximum of 30 while the minimum attitude score was 21 with a maximum of 105.

For the intervention group, the question "If I can help you to quit smoking, are you ready?" was used to try to create motivation for based on Guideline (according to the stage where patients were). For patients who wished to quit, 5A (Ask, Advise, Assess, Assist, and Arrange) and for patients who did not wish to quit, 5R (Relevance, Risks, Rewards, Roadblocks, and Repetition) strategies were applied [24].

In intervention group, questionnaire was completed at three times points: at baseline (before counseling), immediately after a brief tobacco control and at a one-month follow-up. For the control group, questionnaire was completed at two times points (at baseline and at one-month follow-up). Smoking cessation counseling and brochure were given to both groups for the second time after completing the questionnaire.

We performed a between-group analysis at 1 month (independent t-test) and a within intervention comparison of baseline vs. 1 month (paired t-test).

Mann-Whitney U test was used to compare quantitative variables with abnormal distribution between case and control groups.

Wilcoxon signed-rank test was used to compare the change cycle stages in the case and control groups.

To analyze the role of different variables, including interference and other possible confounding variables such as age, sex and level of education, multivariate linear regression models were used.

All analysis using the software SPSS vs. 18 were done. The significance level of less than 0.05 was considered.

Results

One hundred and fifty patients, 75 patients from each group either intervention or control groups participated in this semi-experimental study.

A majority (84.7%) of the participants were male; 8.8% under 30 years old, 5.3% between 30 to 45 years old, and 6.8% more than 45 years old. 20.6% high school diploma, 16.7% diploma and 62.7% academic education There were no significant differences between intervention and control groups in terms of sex, age group, and education level.

As shown in table 1; at baseline, approximately 70% of patients were in pre-Contemplation stage, with 5% in contemplation, 1% in preparation, and 3% in action stages. At baseline, there were no significant differences between intervention and control groups in terms of change cycle stages. In control group, the proportion of people in different stages of change did not vary after the one month follow up. But this proportion significantly changed in the intervention group($p=0.006$); in the way that patients in pre-contemplation stage decreased by 43%, patients in contemplation stage increased by 20%, and patients in action stage increased by 16%.

Table 2 shows the relationship between demographic variables and individuals' movement in through change cycle stages. Younger age group had significantly more forward movement in change cycle while more than 80% of middle age or old age group experienced no change or backward movement ($p=0.012$). Compared to the 99% of control group with no movement in change cycle stages, 45% of people in case group experienced forward movement in change cycle stages ($p=0.000$).

As shown in table 3, regression analysis showed that one-month follow-up knowledge was associated with age, gender and cycle stage. However, attitude was associated with being in case group and cycle stage.

Discussion

The results from this study showed that the participants who received smoking cessation counselling moved forward in the change cycle, successfully. Also, the attitude of participants who had received counseling improved obviously. This shows a significant and positive effect of smoking cessation counseling by a dentist in a dental setting on the cycle of change and perspective of patients

This study benefits from a semi-experimental design with a control group permitting to assess the effectiveness of counselling on readiness to change. The other advantage is using a theory-based model which can ultimately show the participants moving on the change cycle.

We found that after a one month follow up, patients in pre-contemplation stage decreased by 43%. Patients in contemplation stage increased by 20% and patients in action stage increased by 16%. These changes implicate that the counselling intervention could result in more people thinking of and going through the smoking cessation. Other studies also concluded that smoking cessation interventions in dental offices and other social environments may increase smoking cessation in smokers [16,19].

Campbell et al in 1999 studied patients' attitude about smoking cessation counseling in dental offices and showed that most of the patients believed that smoking cessation counseling should be presented in dental offices but many of the dentists did not accept it [18].

Prochaska and DiClemente in 1983 placed the participants in five different stages including pre contemplation, contemplation, action, maintenance and relapse. The results showed that self-changer participants experienced the minimum change processes in pre contemplation [21]. In the current study it was found that 76% of participants in pre contemplation stage were decreased to 33% after intervention.

Ma et al in 2003 concluded that participants older than 21 years old were more motivated for smoking cessation than the one younger than 21 years old. However, in the current study younger participants (less than 30 years old) had forward movement in change cycle compared to the older ones [13].

Our study showed that one month follow up knowledge was associated with age, gender and cycle stage. However, attitude was associated with being in case group and cycle stage.

Garnier et al in 2010 found that regular educations to dentists about smoking may improve smoking counseling [25]. Therefore, we should look for a solution to help dentists perform their best and decreased the possible obstacles.

To do more studies in this area, we suggest that the possible obstacles should be evaluated in providing smoking cessation counseling by dentists in other dental settings including private dental offices. And the results of smoking cessation counseling should be evaluated for a longer time. Also to use the ability of dentists in smoking cessation counseling, some changes should be applied in dentistry educational programs.

Conclusions

The smoking cessation counseling enhances forward movement through the stages-of-change of smoking cessation. Measurement of this movement may be an important intermediary in evaluating small clinical trials of counseling.

List Of Abbreviations

Trans-theoretical model (TTM)

5A (Ask, Advise, Assess, Assist, and Arrange)

5R (Relevance, Risks, Rewards, Roadblocks, and Repetition)

Declarations

-Ethics approval and consent to participate:

This study was approved by the Committee of Ethics in Research Affairs of Dental School, Shahid Beheshti University of Medical sciences.

To whom it may

Hereby, it is to certify that research entitled "The Effects of Smoking-Cessation Counseling Based on the Stages-of-Change Model in Dental Patients; Semi-Experimental Study" which was carried out by Zahra Hosseini, Postgraduate Student, Department of Pediatric Dentistry, has been approved in the "Research Ethics Committee of School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Ethical Committee ID: IR.SBMU.DRC.REC.1392.3200

-Consent for publication:

Not applicable

-Availability of data and material:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

-Competing interests:

The authors declare that they have no competing interests.

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-Authors' contributions:

Conception and design of study/review/case series: ZG,AEA,ZH. Acquisition of data:AEA,ZH,SA. Analysis of collected data:ZH,SA,ZG. Interpretation of data:ZH,ZG,SA,AEA. Drafting of paper and/or critical revision: ZG,AE,ZH,AEA,SA. All the authors have read and approved the manuscript to be submitted to BMC Oral Health.

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Tables

Table 1. Percentage of patients of case (n=75) and control groups (n=75) in change cycle stages.

	Group	Change Cycle Stages					
		Pre-Contemplation	Contemplation	Preparation	Action	Maintenance	Relapse
Baseline	Intervention	76	5.3	1.3	2.7	0	14.7
	Control	66.7	10.7	0	5.3	0	17.3
One Month Follow up	Intervention	33.3	25.3	14.7	18.7	0	8
	Control	65.3	12	0	5.3	0	17.3

Table 2. Percentage of patients change behavior within the TTM change cycle after a brief tobacco cessation counselling in a dental setting.

Variables	Degree of movement of change in cycle stages							
		5	3	2	1	0	-3	-4
Gender	Female	0	8.7	0	13	73.9	0	4.3
	Male	0.8	7.1	6.3	8.7	73.2	2.4	1.6
Age	<30	2.3	13.6	4.5	15.9	63.6	0	0
	30-45	0	7.6	9.1	4.5	72.7	4.5	1.5
	>45	0	0	0	10	85	0	5
Education	High school	0	3.2	3.2	12.9	74.2	0	6.5
	Diploma	0	4	4	8	84	0	0
	Academic	1.1	9.6	6.4	8.5	72	3.2	1.1
Group	Control	1.3	14.7	10.7	17.3	48	4	4
	Case	0	0	0	1.3	98.7	0	0

Table 3. Regression analysis of different variables and their association with the knowledge and attitude scores.

Model	Dependent variable: knowledge 2	P.value	Dependent variable: attitude 2	P.value
	Beta		Beta	
intervention or control group	0.110	0.146	-0.21	0.009
Age	-0.24	0.009	-0.035	0.72
Gender	-0.23	0.002	-0.062	0.43
Education	0.030	0.713	0.138	0.12
Cycle stage(At baseline or One month follow)	0.33	0.001	0.236	0.004