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Predictors of intention to quit smoking among hospital male staff

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Abstract

Smoking is the most preventable cause of premature death in the world. And its disadvantages imposes heavy financial burden on the health system. Due to the great advances in health education, health care approach to identify factors associated with smoking cessation changed and models of health education emphasized, and most useful of them are transtheoretical model (TTM). This study examined predictors of smoking cessation among male staff in the hospitals. This study included a convenience sample of 200 current and former smokers staff employed at four hospitals. The instruments included decisional balance scale, self-efficacy scale, processes of change scale (behavioral and experiential), and stages of change which self-reportly completed. The results showed that 66.5% of participant were located in earlier stage of change, self-efficacy and processes of change and decisional balance significantly correlate with stage of change, and experiential processes of change (β=0.067), self-efficacy (β=-0.059) and behavioral processes (β=0.027) were the strongest predictor of stage of change respectively. The results revealed that increases in readiness to quit smoking were significantly predicted by mechanisms of self-efficacy and experiential process of change such as environmental reevaluation and behavioral process of change such as stimulus control and counter conditioning, which can lead to positive progress in stage of change in smokers. These results support the application of TTM for smoking cessation interventions and indicate that the procedure was very effective in improving intention to quit smoking among hospitals staff.

Keywords: Smoking, Staff, stage of change model

Introduction

Poor lifestyle is one of the factors that causes incidence of chronic disease. One of the most important factors that influences lifestyle is smoking. Smoking in the workplace affects the health and income of the smoker. Scientific evidence has shown that exposure to second-hand tobacco smoke is a potential source of the same illnesses as smokers and liable to workplace air pollution which lead to occupational health problem. This problem

is more acute, if the worker is particularly sensitive because of, for example, asthma or pregnancy. Explosions and fires could often be avoided if smoking were prohibited. Lack of concentration during smoking and the potential source of conflict between smokers and non-smokers also argue in favour of considering the adoption of appropriate measures to deal with the phenomenon seriously [1].

According to the world health organization report in 2011, one billion three hundred million people were cigarette smokers around the world, of which 84% areindeveloping countries. According to the healthy plan of the research deputy of health ministry in Iran In 2012, 27.3% of menand 3.4% of women were smokers, and 66.3% of people have started smoking at the ageof 15-24 years [2].

Smoking is something most of us call a `bad habit´ and surely we do so for a good reason. The disadvantages of smoking are numerous and well-known. The European commission of health declared tobacco use as "the largest single cause of avoidable death in the EU". The awareness of the negative effects of smoking has grown, but still, around one third of the European population continues to smoke (European commission, 2010) [3].

Workplace smoking can be a serious safety and health hazard and a cause of confliction. A smoke-free work environment under the ILO's mandate can cause healthy and safe workplaces. Iran in Compared with 16 countries in the WHO eastern mediterranean region of the country, after Oman, United Arabic Emirates, Saudi Arabia, Sudan and Bahrain ranked sixth in workplace smoking And in the world, along with India, with an average 26% smokers Iran is ranked thirty-third [4].

Each year, smoking is responsible for 5million deaths And it is estimated that by 2030 will reach 10 million. While 80% of premature deaths will occur in low-income and developing countries [5]. Proposing to quit smoking, is an integral part of the Anti Tobacco process [6].

A new model of smoking behavior change has recently emerged that promises to address all of these issues – problems low patient compliance, practitioner frustration, low success rates, and early dropouts and relapsers- and practitioners are understandably enthused. Prochaska & Diclemente, describes a framework in which individuals move through stages according to their motivation to change their behavior. Thetranstheoretical model describes five stages: precontemplation, contemplation, preparation, action, and maintenance. This model has been validated and adapted in a variety of addictive and health related behaviors and has been effectively applied to smoking cessation. Accordingly, this model was used as an assessment of stage of change at baseline and follow-up to explore whether individuals experience a change in their readiness to quit smoking. Other Constructions of this model are self-efficacy, decisional Balance and process of change, the relation of this constructs with stage of change determinate behavioral changes in target populations [7].

In this regard, the examining stage of change of smoking behavior in staffs is important in the development or design of successful cessation programs that address their specific needs in different stages of change. In line with such a possible association between smoking behavior change and Them are Transtheoretical Model (TTM) constructs, many studies in this area have been designed and implemented across the wide range of population, especially in the western countries. Linda et al.'s study showed most of the subjects were in earlier stage of smoking behavior and Three factors were identified as major contributors toward quitting smoking: a high stage of readiness, previous experience with barriers to smoking cessation, and past experience with quitting [8]. Eshetu et al.'s study indicated that two hundred and nineteen (57%) smokers in the study area had the intention to quit cigarette smoking within the next six months and all the process of change had an increasing trend across the stages [9]. It is important to develop an adequate understanding of the factors related to smoking quitting and its maintenance. This study is based

on transtheoretical model for proposing the formulation of appropriate interventions with regard to the strongest predictor structures to prevent and reduce smoking among employees in Ardebil hospitals.

It was hypothesized that:

1) Self-efficacy have relationship with stage of change

2) Decision balance have relationship with stage of change

3) Process of change have relationship with stage of change

4) Process of change have effective role in progress in stage transition

Method

This study included a convenience sample of 200 current and former smokers staff employed at four hospitals in city of Ardebil. Prior to beginning data collection, permission was obtained from the Institutional Review Board at the Ardebil medical sciences university (ARUMS). in the current study a 2-stage sample design was conducted. The first stage involved determining sample size, so stage of change questionnaire were distributed to 834 male staff from four Ardebil hospitals, of which 590 questionnaires were returned (response rate of 70.74%). Among them, 220 (37.28%) male staff were identified as current or former smokers and met the study criteria.

Stage 2: among employees who met the study criteria 200 person voluntarily enrolled in this study. Eventually the study conducted with distributing of transtheoretical model tools among this population .

According to transtheoretical model inclusion criteria was to have smoked at least one cigarette during the past 30 days and nonesmokers who quit smoking within six month ago.

The tools of this stady included:

Stage of change: Short form of stage of change is a three-question algorithm designed to assess the motivation of the individual to quit smoking while placing him into one of the five stages of change depending on his willingness to quit in the next month or next six months. Precontemplation, contemplation, and preparation stages have been found to predict attempts to quit, as well as cessation success at 1- and 6- month follow-ups. Perceived Competence Scale includes four items using a Likert scale that reflect participants' feelings of competence to quit smoking from not at all true to true. Item responses are averaged, with higher scores indicating higher perceived competence to quit smoking. The Perceived Competence Scores has demonstrated adequate reliability (alpha>0.80) [10]

Processes of change scale.

The short form (20-item) version of the original 40-item processes of change questionnaire was used to assess this TTM contrast in order to reduce the response burden on participants (Fava et al 1991). Paticipants responded to two statements for each of the 10 processes (Experiential and behavioral), indicating the frequency of their use of that process on a 5-point Likert scale (1=never, 5=repeatedly). In the present study, internal consistency for 10 subscales was variable, ranging from r=0.40 to r= 0.80 [11].

Decisional Balance Scale: The next construct in the TTM is the Decisional Balance scale. In this study Short form of the Decisional Balance Scale (DBS) is used. The decisional balance scale judges the relative importance of the positive aspects for the behavior change as well as the negative aspects of the behavior change. When appraising the Decisional Balance scale, a distinct pattern begins to emerge. During the precontemplation phase, the positive aspects of the negative behavior overshadow the negative aspects of the behavior. During the contemplation stage, the positive aspects and negative aspects appear more equal. During the preparation and action stage of the TTM, the negative aspects of the negative behavior outweigh the positive aspects of the negative behavior.

The smoking version of the DBS asked to rate how important each item is in their decision to smoke on a 5-point Likert-type scale in which 1 = not at all and 5 = extremely. Internal consistency measured by Cronbach's alpha coefficient is .87 for pro items and. 90 for con

items, and both sets of items show strong predictive validity for future smoking behavior [12].

Self-efficacy/temptation: The final construct found in the TTM is that of self-efficacy/ temptation. The construct details the confidence of the individual to continue with the positive behavior change. specifically, the self-efficacy/ temptation construct can depict the confidence of the individual to continue with a positive behavior in the face of temptation to revert to the previous behaviours. The temptation to smoke scale asks individual to rate feelings of temptation to smoke in each situation from 1=not at all tempted to 5=extremely tempted. The positive/social subscale for temptation had an internal consistency reliability alpha of .84. The negative/affect subscale for temptation had an alpha of .92, and the habit/addictive for temptation scale had an alpha of .80 [13].

Approval for the study was obtained from the research board of the Ardebil medical sciences university, before the questionnaires were Distributed. Questionnaires were distributed to hospital employees after obtaining approval for the study from the hospitals managers. Verbal consent was obtained prior to data collection from the staffs who agreed to participate in the Study. the survey was conducted anonymously, and took approximately 50 minutes to complete.

Descriptive statistics were used to assess general and smoking-related characteristics of the study par- ticipants. Correlation analysis was performed to illustrate relationships between variables. One way ANOVA analysis were used to test the effects of processes of change in stage transition. Ordinal logestic Regression analyses were performed to test strongest predictor of stage of change. Data were screened for data-entry accuracy and to assure that the assumptions of the statistical tests had been met. Differences with a probability of less than 0.05 were considered to be statistically significant. SPSS-21 was used for the analyses.

Results

The mean age of the employees who participated in the study were 38.4 years old, 92% of the investigated participants were married. 12% of them were post graduate. 75% of participant reported up than seven million rials monthly income. 38.5% of them have started smoking at teens period. 25% of the subjects had parents who smoke.and83 % (n=166) were current smokers and 17% (n=34)

Table 1 *General characteristics of the study participants (n=200)*

	Value	N	%
Education	Diploma or less than diploma	104	52
	Bachelor	72	36
	Post graduate	24	12
Income (monthly)	Less than 7 mil rial	111	55.5
	Up than 7 mil rial	89	44.5
Smoking status	Former smoker	34	17
	Current smoker	166	83
Stage of change	Precontemplation contemplation	74	37.0
	Preparation	59	29.0
	Action	33	16.0
	Maintenance	12	6.0
		22	11.0
Family smoking	Parent	50	25
	Grand fother ∞ grand mother	15	7.5
	Brother ∞ sister	21	10.5
	All of above	12	6
	None of them	102	51
Cigaretts (per day)	10 or less	137	68.5
	11 – 20	43	21.5
	21 – 30	9	4.5
	31 or more	11	5.5
Marriage	Married	184	92
	Single	16	8

were former smokers. Regarding the stages of change, 37.0%, 29.5%, 16.5%, 6% and 11% were in the pre- contemplation, contemplation, preparation, action, and maintenance stages, respectively (Table 1).

Correlation matrix of processes of change, decisional balance and self-efficacy

Correlation analysis results indicated that stages of change were significantly correlated with behavioral processes, pros of smoking, cons of smoking and self- efficacy ($p<0.01$). Behavioral processes was significantly associated with experiential processes, pros of smoking, cons of smoking and self-efficacy ($p<0.01$; Table 2).

Evaluating stage transitions

To assess the effects of processes of change on possitive progress in stage of change, one-way Anova was used and revealed that participants for progressing in stages of change applied behavioral processes such as stimulus control and counter conditioning (see Table 3).

Table 2 *Correlation matrix of stages of change, processes of change, decisional balance and self-efficacy*

	Stage of change	Experiential Processes	Behavioral Processes	Cons of Smoking	Pros of smoking
Processes of change Experiential processes Behavioral processes	0. 068** 0. 026**	0.001**			
Decisional balance Cons of smoking Pros of smoking	-0.055** -0.020**	0.001** -0.051**	0.001** -0.036**	-0.026	
Self-efficacy	-0.062**	0.050**	0.001**	0.023**	0.001**

**Correlation is significant at the 0.01 level (2-tailed).

Predictive power of TTM constructs in smoking cessation in Ardebil Medical Sciences University Hospital Employees based on ordinal regression

Table 3 *Evaluating stage transitions based on processes of change in Ardebil medical sciences university hospital staff in 2013*

Stage of change Process of change	Precontemplation SD	 M	Contemplation SD	 M	Preparation SD	 M	Action SD	 M	Maintenance SD	 M	One-way Anova
Experiental	8	27	7	34	9	31	8	35	7	40.09	0.001**
Behavioral	8.09	26	7	29	6.09	28	3	30	7	37	0.001**
Consciousness raising	2	5	2	6	2	6.09	2	7	1	8	0.001**
Environmental Reevaluation	2	5	2	6	2	6	2	6	2	8	0.001**
Self-reevaluation	2	5	2	7.01	2	6	2	7	2	8	0.001**
Social liberation	2	5	2	6	2	5	2	7	2.01	7	0.001**
Dramatic relief	2.03	6	2.03	7	2.02	7.03	1	6	2	7	0.025*
Helping relationships	2	5	2	5	2.07	5	2	5	2	7	0.082
Self-liberation	2	6	1	7	2	7.03	1	8	2	8	0.001**
Counterconditioning	1	5	2.01	4	2.04	4	1	5	2	7	0.001**
Reinforcement management	2	4	2.09	5	2	4	2	4	2.05	5	0.025*
Stimulus control	2	4	2	5	2	6	1	6	2	8	0.001**

Ordinal regression analysis were used to determining of Predictive power of TTM constructs in smoking cessation in Ardebil medical sciences university hospital employees and revealed that expriential processes of change, Self-efficacy, Behavioral processes of change were strongest predictor of smoking cessation respectively (see Table 4)

Note: the reduced efficacy score in self-efficacy (increased craving scores) also reduced the possibility of positive progressing in stage of change

Table 4 *TTM constructs prediction in smoking cessation in Ardebil medical sciences university hospital staff in 2013*

Ordinal Regression	β	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EXP	0.067	0.020	10.000	1	0.001	0.027	0.001s
BP	0.027	0.025	1.000	1	0.001	-0.021	0.075
DB	-0.041	0.030	1.000	1	0.001	0.000	0.019
SELFE	-0.059	0.018	11.000	1	0.001	-0.094	-0.025

Discussion

The present study performed a rigorous psychometric evaluation for the translated Iranian version of the short form TTM questionnaire for smoking cessation. In general, the result showed that it was a valid instrument for measuring smoking behavior change among hospital male staff in Ardebil city. Developing theory-based instruments are considered an important prerequisite for any attempt to implement and evaluate health education/promotion interventions. Therefore in this context we believe the findings from the current study could be helpful for those who are involved in tobacco control programs both at action level and at research settings. study demonstrated that the majority of people was in earlier stage of change and had no desire to quit smoking. The current study results were consistent with previous studies that saime erol & semra erdogan conducted in that high school students were in earlier stages. [14] Another Study which conducted by linda et-al among Jordanian university students consistent with current study. [8] as well study results revealed that decisional balance, self-efficacy and processes of change significantly correlate with stage of change. The current study results were consistent with previous studies that used TTM in testing of smoking cessation among Korean young students. [15] while farmanbar et al in predictors of smoking cessation based on transtheoretical model among smokers in Pars-Khazar factory of Rasht in 2012 found that only processes of change correlate with stage of change. [16] The current study found that Expriential processes of change, Self-efficacy, Behavioral processes of change strongly predicts stage of change. Therefore, it is assumed that this TTM constructs can lead to positive progress in smoking cessation stages. Wagner, burg, & sirois found that within the framework of TTM, behavioral processes of change was associated with advancing stages among adult smokers. [17] one-way anova results between process of change and stage of change revealed that participants according to their stages, applied different processes of change in which behavioral and experiental processes of change lead to stage transition or positive progress in smoking cessation stages. The current study results were consistent with previous study that used TTM in testing of smoking cessation among smokers in Pars-Khazar factory of Rasht in rasht, in that farmanbar. et al found that behavioral processes of change were strongest predictor of stage of change and resulted in progressing in stage of smoking cessation. [16] while

Ok Kyung Ham & Jae Bok Yoo found partial mediation of self-efficacy in stage transition among Korean young student. [13]as well mazloomi et al. found that decisional balance mediated the relationship between processes of change and stages of change of exercise behavior and lead to stage transition. [18]
Conclusions: The study results revealed that increases in readiness to quit smoking were significantly predicted by mechanisms of self-efficacy and Experiental process of change such as Environmental Reevaluation and behavioral process of change such as stimulus control and counter conditioning, which can lead to positive progress in stage of change in smokers and smoking quiters. Future studies should explore the effect of smoke ceccation interventions based on Transtheoretical model. Two limitations are noteworthy. The focus on a predominantly community employee sample potentially limits the generalizability of the results from this study to other age or populations. Second, this study assessed smoking status at follow-up by self-report rather than using a biochemical method. Although biochemical verification of status of smokers is often preferred, self-report is typically noted as valid. Future efforts should attend to increasing instrument practicality.

Conclusion

The study results revealed that increases in readiness to quit smoking were significantly predicted by mechanisms of self-efficacy and experiential process of change such as Environmental Reevaluation and behavioral process of change such as stimulus control and counter conditioning, which can lead to positive progress in stage of change in smokers and smoking quitters. Future studies should explore the effect of smoke cessation interventions based on Transtheoretical model. Future efforts should attend to increasing instrument practicality.

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Contribution

Study design: SN
Data collection and analysis: SN, EKL, RF
Manuscript preparation: SN

Conflict of Interest

"The authors declare that they have no competing interests."

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