

# Smoking behavior, nicotine dependency, and motivation to cessation among smokers in the preparation stage of change

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## ABSTRACT

**Objective:** To investigate selected constructs of the transtheoretical model (TTM) of behavior change regarding smoking behavior among people in the preparation stage, as well as motivation for cessation and nicotine dependency. **Methods:** A convenience sample of 123 smokers, during between June to and September 2011, completed the Persian version of the short form of a smoking questionnaire based on TTM, the Fagerstrom nicotine dependence test, and the motivational test. **Results:** Motivation for cessation was great ( $16.35 \pm 2.45$ ). The negative affects of self-efficacy were higher than those to other situations ( $4.02 \pm 0.84$ ). The pros and cons of smoking were  $2.69 \pm 1.00$  and  $3.78 \pm 0.78$ , respectively. Temptation was influenced by nicotine dependency ( $P < 0.05$ ). Early initiation of smoking was significantly associated with severe nicotine dependency ( $P < 0.05$ ). **Conclusion:** The results confirm the role of temptation, increase in the cons, decrease in the pros, and nicotine dependency.

**Key words:** Transtheoretical Model, Stages of Change, Decisional Balance, Temptation, Smoking Behavior, Nicotine Dependency, Motivation for Cessation

## INTRODUCTION

According to the World Health organization (WHO) reports, smoking is the leading preventable cause of death in the world, accounting for about five million deaths per a year.<sup>[1]</sup> The Iranian Ministry of Health (IMH) estimated that about 750000 Iranians died from smoking complications in 2006,

and reported that currently 15% of the men aged 15 and older smoke.<sup>[2]</sup>

The Transtheoretical Model (TTM) was developed and introduced to understand the behavior change, especially the change associated with addictive behaviors.<sup>[3]</sup> The TTM not only delineates a way to conceptualize behavior change, but also provides a foundation for developing assessments of the individual's readiness to change, and for tailoring interventions to actualize the behavior change.<sup>[4]</sup> The TTM consists of five stages of smoking behavior: (a) Precontemplation (individuals are smoking and not intending to quit smoking in the next six months), (b) Contemplation (individuals are smoking, but are considering quitting in the next six months), (c) Preparation (individuals are smoking, but are planning to quit smoking in the next 30 days), (d) Action (individuals have actually quit smoking and been abstinent for less than six months), and (e) Maintenance (individuals have quit smoking and been abstinent for more than six months after

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initial quitting).<sup>[5]</sup> The two intermediate indicators of when changes occur are decisional balance and self-efficacy.<sup>[4]</sup> They also explain behavior change strategies through 10 process of change, which will not be discussed in this article.

Decisional balance is defined as the potential benefits (Pros) and costs (Cons) of behavior change.<sup>[6]</sup> In moving toward any decision, individuals weigh the costs and benefits of the action being contemplated. In change of behavior, these considerations are known as decisional balancing, a process of cognitively appraising or evaluating the 'good' aspects or pros, the 'less good' aspects or cons of a behavior, the reasons to change or not to change that behavior. Lasting behavior change is associated with the pros of the behavior change increasing and the cons of change decreasing, until the point of crossing over is reached.<sup>[7]</sup>

The concept of self-efficacy is a component of Bandura's social learning theory defined as one's perceived confidence in the ability to carry out a specific behavior.<sup>[8]</sup> In smoking behavior, self-efficacy represents the subjects' level of confidence that they can resist smoking across a number of tempting situations.<sup>[9]</sup> Self-confidence to resist smoking temptations has tended to be low among precontemplators and much higher as the smoker acts and maintains abstinence.<sup>[10]</sup>

Besides motivation and readiness, successful smoking cessation was impressed by nicotine dependency. Having the withdrawal symptoms to nicotine abstinence is a strong motivator to continue smoking.<sup>[11]</sup> In this regard, Nicotine Replacement Therapy (NRT) is an effective way to overcome the physiological withdrawal symptoms because of its ameliorating affects.<sup>[12]</sup>

The examining of smokers in the preparation stage of smoking behavior and its relation to nicotine dependence is important for developing and designing successful cessation programs. We aimed at studying the relationship of readiness and motivation for quitting and the role of nicotine dependency with decisional balance and self-efficacy among smokers.

## MATERIALS AND METHODS

### Participants

The participants were a convenience sample of 123 smokers of Gorgan city, in the northern part of Iran, who were in the preparation stage of change from smoking behavior. The majority of them (95.1%) were married. They were between 24 - 67 years, with a mean (SD) age of  $40.64 \pm 10.07$  years. They were long-standing smokers for  $20.17 \pm 10.08$  years, who smoked an average of  $21.02 \pm 10.58$  cigarettes per day. Of them, 79.1% had tried to quit at least once (mean = 8.1 time) and were successful for an average of 18.3 days.

### Instruments

In order to identify smoking behavior, the stage of smoking behavior was assessed using the five-item, dichotomous scale (yes / no), related to current smoking behavior and intention to quit smoking, used by Diclemente *et al.*<sup>[13]</sup> The decisional

balance was assessed by a six-item short form questionnaire designed by Velicer *et al.*<sup>[14]</sup> Participants' rating was marked on a five-point Likert scale, rating from 'not important' to 'extremely important'. The reliability was assessed by internal consistency, with Cronbach's alpha, which was acceptable ( $\alpha = 0.87$ ).

The self-efficacy scale to avoid smoking temptation was assessed by Velicer *et al.*'s<sup>[15]</sup> short form questionnaire containing nine items, which assessed the participants' perceptions of their ability to refrain from smoking in various situations. Participant rating was made on a five-point Likert scale, rating from 'not at all tempted' to 'extremely tempted'. Self-efficacy has showed acceptable psychometric properties with Chronbach's alpha = 0.62.

The Persian versions of the stages of change, self-efficacy, and decisional balance scales were assessed for validity and reliability by using the Banville method, which is described elsewhere.<sup>[16]</sup>

Nicotine dependency was assessed by the Fagerstrom Test for Nicotine Dependence (FTND). The score of 6 - 10 was an indication of severe nicotine dependency and 1 - 5 of slight nicotine dependency.<sup>[17]</sup> The FTND reliability was acceptable by using Chronbach's alpha = 0.71.

Motivation to cessation was evaluated by using the motivational test. This test was applied in Persian, by Heydari.<sup>[18]</sup> The test included one question related to the current quitting importance and another one to the individual decision about giving up. These two questions were made on a four-point Likert scale, rating from 'not important' to 'extremely important'. The third question associated with the reasons for cessation had six reasons. The last question asked about cessation foresight, rating by six-point Likert scale, from 'extremely successful' to 'very slightly successful'. The range of total score was 4 - 20. The subjects were divided into three motivation subgroups including low (4 - 9), moderate (10 - 15), and high (16 - 20).

### Procedure

In order to reach the potential respondents, we sent a message through Short Message System (SMS) to 40000 cell phone numbers in three periods of time, separately. Besides that, 100000 advertising papers in A4 size were distributed in all parts of the city. The content of the two messages was the free-of-charge smoking cessation programs. The respondents were asked to answer the questions and they were guaranteed of their privacy. The age of smoking initiation was used to categorize participants into early ( $\leq 19$  years) and longer ( $\geq 20$  years) smoking initiation.

### Analysis

We analyzed the data, using SPSS 15. Frequency analysis was conducted using demographic and continuous variables. The correlation was assessed by the Pearson correlation test. Independent *t*-tests were performed to analyze any differences

in mean nicotine dependence points. Alpha levels were set at  $P < 0.05$ .

## RESULTS

According to the motivation for cessation test, the results showed that 85 (68.3%) subjects had high, 38 (30.9%) moderate, and 1 (0.8%) had motivation for quitting. Overall, the motivation score was 16.35 out of 20. In terms of nicotine dependency, the Fagerstrom test indicated that 61 (49.6%) subjects had a high, and 62 (50.4%) had a slight dependence on nicotine. The mean of FTND was 5.35 on a scale of 1 - 10. The result of the independent  $t$  test revealed that the early initiation of cigarette smoking was associated with the longer duration of smoking (22.06 years vs. 18.32 years) and increased nicotine dependency (6.18 vs. 4.54) ( $P < 0.05$ ).

The Mean and SD of the temptation and decisional balance of the respondents are shown in Table 1.

Between temptation and nicotine dependency was a significant correlation ( $r = 0.497$ ), the highest correlation had to do with habit strength ( $r = 0.573$ ), positive social efficacy ( $r = 0.421$ ), and negative affect efficacy ( $r = 0.290$ ).

## DISCUSSION

The current study is the assessment of smoking behavior among smokers, in the preparation stage. The data regarding temptation indicated that the subjects had a high temptation, especially in habitual situations like 'long-lasting imagination of no smoking', 'smoking for feeling high,' and 'smoking after getting up in the morning'. The temptation in the aforementioned situations is due to a high dependency to nicotine.

Based on TTM, the self-efficacy / temptation scores to avoid smoking temptation significantly differed between the stages of smoking.<sup>[16,19-21]</sup> Related to this factor, intervention for problem-solving could be useful for self-control and should be targeted in quitting programs. These situations could relapse after the giving-up periods, especially in the early days as well as in the action stage.

Furthermore, the results related to positive affect / social situation indicate that subjects in the early stages. Like preparation, are at a high risk of situational temptations, such as, peer pressure, parties, and situational cues. However,

an increase in confidence to resist smoking temptation is necessary to move from the preparation to the maintenance stage. This finding may be useful for further smoking cessation programs, because when consideration is given to self-efficacy to avoid temptations and increase the subjects' confidence, he / she will overcome the obstacles of cessation.

The high score of temptation can be explained by the high dependency on nicotine. According to the Fagerstrom test, a significant relationship was observed between temptation and nicotine dependency. On the other hand, the higher the temptation of the subjects were the more excessive their nicotine dependency. This finding supports the role of NRT for any smoking cessation intervention.

Regarding decisional balance, the results revealed that there were higher pros and lower cons for smoking cessation among the subjects. This result was not unusual and was harmonious with the expected patterns. According to the TTM, decisional balance reflects an individual's weighing of the pros and cons of changing.<sup>[22]</sup> The expected patterns of relationship between decisional balance and stages of changes are the cons of smoking being of less importance than the pros of smoking, for those smokers in the precontemplation stage, then the pros and cons intersect at the contemplation stage, and finally, the cons have a greater importance than the pros in the later stages of the change.<sup>[14]</sup> The observed pattern in the current study confirms the opinion that the negative aspects of smoking should be focused on, to move them from the preparation stage to smoking cessation and then move them to the later stages. This result is not consistent with Velicer *et al.*'s;<sup>[14]</sup> and Kim's<sup>[23]</sup> findings.

Nicotine dependency and longer duration of smoking were higher in people who started smoking before the age of 20. Consistent with our findings, the results of several studies indicated that early initiation of smoking was a significant predictor of smoking cessation and continuation of smoking later in life. Furthermore, this factor was associated with higher nicotine dependency and was a risk factor for relapse.<sup>[20,21,24,25]</sup>

This study has limitations in its generalizability. Being a cross-sectional study, with convenience sampling, and the subjects in the preparation stage of smoking behavior are the limitations. Another limitation is the self-report nature of the questionnaire, in spite of being anonymous. Future research is necessary to address these limitations and longitudinal designs are recommended in order to examine the stability of different smoking predictors across time.<sup>[26,27]</sup>

## CONCLUSION

The current study shows that people who are in the preparation stage have high motivation for cessation, considering the cons of smoking are higher than the pros, but they report a high temptation, especially in the habitual / craving situation. On account of a significant correlation between temptation and nicotine dependency, NRT could be helpful for any cessation.

**Table 1: Mean and SD of the temptation and decisional balance of the participants**

Temptation	Positive Social Efficacy	3.66 ± 0.87
	Negative Affect Efficacy	4.02 ± 0.84
	Habit Strength	3.60 ± 0.79 <sup>o</sup>
Decisional Balance	Cons	3.11 ± 1.01
	Pros	3.78 ± 0.78
	Decisional Balance	3.23 ± 0.61 <sup>•</sup>
	Pros	2.69 ± 1.00

<sup>o</sup>Mean and SD for Temptation, <sup>•</sup> Mean and SD for Decisional Balance

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