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Depression and stages of change for smoking in psychiatric outpatients[☆]

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Abstract

This article reports on the relations between depression and stages of change for smoking cessation. A convenience sample of 205 psychiatric outpatients (68% female, mean age 41) completed measures of depression Primary Care Evaluation of Mental Disorders [PRIME-MD] and Beck Depression Inventory-II [BDI-II]), all transtheoretical model constructs related to smoking (stages and processes of change, pros and cons of smoking, and situational temptations), and thoughts about abstinence. As hypothesized, patients who had never smoked showed substantially lower rates of currently diagnosed major depressive disorder (MDD) than those who had ever smoked. Patients in early stages of change did not show more MDD or depressive symptoms but, as hypothesized, showed more negative thoughts about abstinence. Findings are consistent with the documented association between smoking and depression and suggest the appropriateness of building smoking cessation interventions based on the transtheoretical model of change for use with psychiatric populations. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Smoking; Depression; Stages of change; Outpatients; Comorbidity

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1. Introduction

Nicotine is one of the drugs most commonly abused by people with psychiatric disorders. Over 50% of psychiatric patients smoke, a rate about twice that of the general population. An early study of a psychiatric population indicated that prevalence of nicotine use was associated with prevalence of schizophrenia, alcohol abuse, and major depressive disorder (MDD) (Hughes, Hatsukami, Mitchell, & Dahlgren, 1986). As part of a larger effort to develop smoking cessation strategies for psychiatric populations, the aim of the present study was to test hypotheses related to smoking, depression, and stages of change, and to provide a current description of cognitive and motivational aspects of smoking in psychiatric outpatients in a large, urban psychiatric clinic.

1.1. *Smoking and depression*

Cigarette smoking is associated with both depressive symptoms and MDD. Nicotine is strongly associated with negative affect. Sad or anxious people may turn to nicotine as a way to regulate negative affect, and psychiatric patients, especially those with clinical mood disorders such as depression, are at great risk for negative affect (Hall, Muñoz, Reus, & Sees, 1993).

There has been considerable interest in continuous measures of depressive symptoms as risk factors for smoking. Studies conducted with a diversity of participant samples have for the most part demonstrated heavier smoking patterns and fewer quit attempts among more depressed smokers. In a cross-sectional study, depressive symptoms were positively correlated with current smoking and negatively correlated with likelihood of quitting smoking (Anda et al., 1990). Longitudinal data collected 9 years later indicated that initially depressed smokers were 40% less likely to have quit than initially nondepressed smokers (Anda et al., 1990). In a longitudinal study of older women, however, depressive symptoms at baseline decreased the likelihood of continued smoking (Salive & Blazer, 1993). In a longitudinal study of 15- and 16-year-olds, depressive symptoms at baseline increased the likelihood of heavy smoking at ages 24–25 (Kandel & Davies, 1986). Among Latino adults, current smokers had more depressive symptoms than former smokers or never smokers (Perez-Stable, Marin, Marin, & Katz, 1990).

Whereas a number of studies have related smoking and depressive symptoms, other studies have related smoking and diagnosed MDD. In a representative US sample, people with a history of MDD were more likely to have a history of regular smoking than were controls (Glassman et al., 1990). In a random US sample of young adults, people with nicotine dependence had higher rates of MDD and anxiety disorders than controls (Breslau, Kilbey, & Andreski, 1991). Among heavy smokers, dysphoric mood and a history of MDD were positively correlated with returning to smoking after a quit attempt (Glassman et al., 1988).

1.2. *The transtheoretical model applied to smoking and depression*

Prochaska and DiClemente (1983) have suggested that motivation to quit smoking can be described as a series of stages of change. The stages provide a framework for organizing and

monitoring smoking cessation progress. The model includes five stages: (a) *precontemplation* — a person has no immediate plan to stop smoking; (b) *contemplation* — a person is contemplating stopping smoking in the next 6 months; (c) *preparation* — a person is considering stopping smoking in the next month and has made at least one quit attempt in the past year; (d) *action* — a person has quit smoking for under 6 months; and (e) *maintenance* — a person has quit smoking for at least 6 months. The transtheoretical model includes both motivational aspects (stages of change, situational temptations) and cognitive aspects (processes of change, pros and cons).

Stages of change have been shown to have high reliability and stability (Morera et al., 1998) and high predictive and construct validity (Crittenden, Manfredi, Warnecke, Cho, & Parsons, 1998). As theorized, stages of change in smoking are related to self-efficacy (Velicer, DiClemente, Rossi, & Prochaska, 1990), decision-making (Velicer, DiClemente, Prochaska, & Brandenburg, 1985), and experiential (i.e., cognitive or affective) and behavioral (i.e., contingency learning) processes of change (Prochaska, Velicer, DiClemente, & Fava, 1988).

The transtheoretical model was developed through observations of how people quit smoking on their own and has proven useful in the design of tailored interventions for smoking cessation (Prochaska, DiClemente, Velicer, & Rossi, 1993). The model has also been applied to the process of change in psychotherapy and shown to be predictive of who remains in treatment (Brogan, Prochaska, & Prochaska, 1999). Although interventions to date have focused mainly on the general population, there is reason to believe that the model will also prove useful in the examination of clinical populations. Before attempting to develop interventions for smoking cessation in clinical populations, it is important to determine the extent to which constructs of the model hold up in these populations, which is one major purpose of this study.

Two theories of depression suggest a relation between depression and stages of change. The contemplation stage is characterized by intending to quit smoking in the next 6 months without actually taking action. Such contemplation bears a strong resemblance to the rumination that is thought to perpetuate depression (Nolen-Hoeksema, 1991). Moreover, both the contemplation and preparation stages are characterized by a failure to achieve one's ideal of quitting smoking. A discrepancy between one's ideal goal and one's actual behavior is thought to result in dejection (Higgins, 1987), and such dejection seems likely to result in higher levels of depression. Although they have not previously been connected, these theories of depression and the stages of change model bear a certain kinship in explaining smoking and depression.

1.3. *The transtheoretical model and thoughts about abstinence*

Thoughts about abstinence are another important determinant of smoking cessation. Specifically, commitment to total abstinence has been shown to be related to success in maintaining nonsmoking and to time between first use and relapse (Hall, Havassy, & Wasserman, 1990).

Thoughts about abstinence should be related to stages of change in predictable ways. For example, precontemplation (having no plans to quit) might be associated with negative thoughts about abstinence, such as lack of desire for abstinence and greater expected

difficulty with abstinence. In addition, a person in precontemplation has, by definition, no plans to quit smoking and therefore does not have a goal of total abstinence. Later stages might be characterized by greater expectation of success at abstinence, because such expectation of success comes from the experience of success, and such experience is a definitional feature of the later stages.

1.4. Hypotheses

We proposed the following hypotheses regarding smoking, depression, and stages of change.

Hypothesis 1: As compared with patients who have never smoked, patients who have ever smoked show higher rates of MDD.

Hypothesis 2: As compared with patients who have never smoked and those in later stages of change, patients in earlier stages show higher rates of MDD and higher levels of depressive symptoms.

Hypothesis 3: As compared with patients in later stages of change, patients in earlier stages report less desire for abstinence, less expectation of success at abstinence, greater expected difficulty with abstinence, and lower rates of commitment to total abstinence.

In addition to testing these hypotheses, we sought to describe the sample in terms of constructs of the transtheoretical model, including stages of change, pros and cons of smoking, situational temptations, and processes of change.

2. Method

2.1. Procedure

All participants signed forms giving informed consent and completed depression measures. Those participants who indicated on a screening form that they had smoked in the past year also completed a packet that included transtheoretical model and abstinence measures.

2.2. Measures

2.2.1. Depression measures

2.2.1.1. Primary Care Evaluation of Mental Disorders (PRIME-MD). The PRIME-MD (Spitzer et al., 1994) is a brief (average of 8.4 min) computer-administered instrument that provides screening diagnoses of current psychopathology (as opposed to lifetime psychopathology) in several diagnostic categories, including mood, anxiety, alcohol, and eating disorders. Diagnoses on the PRIME-MD tend to agree with those of independent mental health professionals (for the diagnosis of any PRIME-MD disorder, $\kappa = .71$,

overall accuracy rate of 88%) (Spitzer et al., 1994). PRIME-MD diagnoses are associated with significant impairment in health-related quality of life (Spitzer et al., 1995). In keeping with the hypotheses, this study included only diagnoses of MDD rather than all psychopathology.

2.2.1.2. Beck Depression Inventory-II (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) is a widely used 21-item measure of depression that has been shown to have acceptable psychometric properties (Dozois, Dobson, & Ahnberg, 1998). Total scores can be divided into cognitive and somatic subscales.

2.2.2. Transtheoretical model measures

2.2.2.1. Stages of change questions. This five-item measure (DiClemente et al., 1991) was used to place patients into one of the following five stages (described above): precontemplation, contemplation, preparation, action, or maintenance. Despite not having completed the stages of change questions, participants who had smoked previously but not in the past year were assigned to the maintenance stage.

2.2.2.2. Smoking status. Categories of smoking status were created based on the stages of change questions. “Current smokers” were defined as those in the precontemplation, contemplation, or preparation stages. “Former smokers” were defined as those in the action or maintenance stages. “Ever smokers” were defined as those in any of the stages of change as contrasted with those who had never smoked.

2.2.2.3. Pros and cons of smoking. This six-item instrument was designed to examine elements of decision making in smoking (Velicer et al., 1985). It is divided into two subscales of three items each, one pertaining to the pros of smoking and one to the cons of smoking.

2.2.2.4. Situational Temptation Inventory. Originally developed as a 31-item measure of situational cues triggering smoking behavior, this inventory was later reanalyzed, and three factors of tempting smoking situations emerged: positive/social, negative/affective, and habit/addictive (Velicer et al., 1990). Finally, a nine-item short form was developed with three items covering each of the factors. This short form was used in the present study.

2.2.2.5. Process of Change Inventory. This 40-item inventory (Prochaska et al., 1988) measures 10 activities used by smokers to change their smoking behavior. The processes are characterized as behavioral or experiential. Experiential processes involve cognitive or affective activities, including the following processes: consciousness raising, environmental reevaluation, self-reevaluation, social liberation, and dramatic relief. Behavioral processes involve the learning of behavioral contingencies, including the following processes: helping relationship, self-liberation, counterconditioning, reinforcement management, and stimulus control. A 20-item short form of the original instrument was used for the present study.

2.2.3. Abstinence measure

2.2.3.1. Thoughts about abstinence. This four-item questionnaire (Hall et al., 1990) includes one-item rating desire for abstinence, one rating expectation of success at abstinence, one rating expected difficulty with abstinence, and one assessing goals for abstinence. The first three items were rated on a 10-point Likert scale. The last item was dichotomized into whether or not participants endorsed total abstinence as their goal.

2.3. Participants

Participants were 205 outpatients receiving treatment at Langley Porter Psychiatric Institute at the University of California, San Francisco. Between August 1998 and March 1999 potential participants were recruited into the study in three ways. First, fliers were placed in waiting rooms in the outpatient psychiatric clinic and were attached to registration materials. Second, all new patients received a verbal description of the study when they were called to be reminded of their initial intake appointment. Third, patients in the partial hospitalization program at the clinic were recruited from a community meeting. Interested patients were told that they would be asked to fill out computerized and paper questionnaires taking approximately 30–50 min and that they would be reimbursed US\$25 for their participation.

Over two-thirds of the sample were female ($n=139$). There were 29% minority participants, including 10% African American, 5% Asian American, 6% Latin American, 2% Native American, and 5% other minority participants, with the remaining 71% being white. Ages ranged from 21 to 92 (mean=41.2, S.D.=12.3). The average number per household was 1.8 (S.D.=1.1). Household income averaged US\$35,696 (S.D.=US\$42,055). Years of education averaged 15.6 (S.D.=3.3).

2.4. Analyses

The stage distribution of the sample was described. Never smokers were compared with ever smokers on MDD using logistic regressions. Depression diagnosis (measured by the PRIME-MD) and the abstinence goal item in Thoughts About Abstinence were analyzed using χ^2 statistics across stages of change (including never smokers for MDD). Pros and Cons, the Situational Temptation Inventory, the Process of Change Inventory, Thoughts About Abstinence (other than the abstinence goal item), and the BDI-II were analyzed using one-way analyses of variance (ANOVAs) across stages of change (for the BDI-II, this included never smokers). Except where otherwise noted, all reported statistics are significant at $P<.05$.

3. Results

When the full sample was broken down by stage of change, 8% were in precontemplation, 12% in contemplation, 8% in preparation, 8% in action, and 33% in maintenance, leaving

Table 1

Average scores and standard deviations on transtheoretical model measures and thoughts about abstinence by stage of change ($N = 79$)

	Current smokers ($n = 58$)			Former smokers ($n = 21$)	
	PC ($n = 17$)	C ($n = 25$)	P ($n = 16$)	A ($n = 16$)	M ($n = 5$)
<i>Pros and Cons of Smoking</i>					
Pros	8.6 (3.5)	7.9 (3.1)	7.9 (3.7)	6.8 (3.1)	6.2 (5.0)
Cons	7.6 (3.2)	10.1 (3.3)	9.6 (3.0)	7.9 (3.2)	9.0 (3.5)
<i>Situational Temptation Inventory</i>					
Temptation total	32.5 (8.3)	34.2 (4.6)	37.7 (14.2)	24.4 (9.0)	21.2 (12.9)
Positive/social	11.0 (2.5)	11.0 (2.6)	12.1 (2.0)	10.1 (3.6)	8.5 (3.7)
Negative/affective	12.1 (3.7)	12.8 (1.9)	12.6 (2.3)	8.6 (3.8)	7.3 (5.3)
Habit/addictive	9.4 (4.0)	10.4 (2.6)	13.3 (12.8)	5.7 (3.1)	5.3 (4.8)
<i>Process of Change Inventory</i>					
Experiential processes	25.1 (5.4)	29.3 (7.5)	29.2 (9.5)	28.6 (10.7)	29.4 (11.9)
Consciousness raising	4.8 (1.8)	4.9 (2.1)	5.4 (2.4)	4.6 (1.8)	5.4 (2.7)
Environmental reevaluation	3.5 (1.7)	4.8 (2.9)	4.6 (2.4)	5.0 (2.5)	4.6 (3.1)
Self-reevaluation	4.4 (2.0)	6.9 (2.1)	6.7 (2.2)	5.4 (2.0)	5.8 (2.8)
Social liberation	7.6 (2.1)	7.1 (1.9)	6.8 (2.3)	8.6 (8.2)	7.4 (3.0)
Dramatic relief	4.6 (1.7)	5.6 (2.3)	5.7 (2.5)	4.9 (2.6)	6.2 (2.2)
Behavioral processes	18.5 (5.9)	20.9 (7.0)	25.7 (7.7)	25.1 (8.6)	29.0 (7.9)
Helping relationship	3.8 (2.2)	4.5 (2.5)	4.3 (2.6)	4.1 (2.6)	5.2 (2.3)
Self-liberation	5.1 (2.1)	5.3 (2.0)	7.3 (1.6)	6.7 (2.8)	7.2 (2.6)
Counterconditioning	4.2 (1.7)	4.4 (2.1)	5.7 (1.5)	6.2 (2.5)	6.3 (1.3)
Reinforcement management	2.8 (1.4)	3.7 (2.1)	3.9 (2.3)	4.0 (2.2)	5.0 (3.2)
Stimulus control	2.6 (0.9)	3.1 (1.5)	4.5 (2.4)	4.1 (2.4)	4.0 (2.0)
<i>Thoughts About Abstinence</i>					
Desire for abstinence *	2.7 (2.0)	5.2 (2.5)	7.6 (2.3)	8.0 (3.1)	8.3 (3.5)
Expectation of success *	2.6 (2.5)	3.7 (2.1)	6.6 (2.1)	8.8 (2.3)	7.5 (4.4)
Difficulty with abstinence *	7.2 (3.2)	7.0 (2.2)	6.6 (2.9)	4.3 (2.6)	3.5 (4.4)

Means appear first, followed in parentheses by standard deviations. PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.

* One-way ANOVA [$F(4,74)$] significant at $P < .05$.

31% who had never smoked. Over two-thirds of the full sample (69%) had ever smoked, with 28% being current smokers and 41% former smokers. Among current smokers, number of cigarettes per day averaged 17.1 (S.D. = 11.7). The sample included more females (68%) and was more highly educated (mean = 15.6 years, S.D. = 3.3) than representative samples of the populations of California, Rhode Island, and other areas of the US (Velicer et al., 1995). Comparisons of stage distribution indicated that the present sample was more ready to quit smoking than the representative samples mentioned, with a smaller percentage of current smokers (i.e., excluding former and never smokers) in precontemplation (29% vs. 37–42%), about the same percentage in contemplation (43% vs. 39–47%), and a larger percentage in preparation (28% vs. 16–20%).

Table 2
Number and percentage with MDD by stage of change ($N=205$)

Never smokers ($n=64$)	Current smokers ($n=58$)			Former smokers ($n=83$)	
	NS ($n=64$)	PC ($n=17$)	C ($n=25$)	P ($n=16$)	A ($n=16$)
27 (42%)	9 (53%)	15 (60%)	10 (63%)	8 (50%)	41 (61%)

$\chi^2(5)$ was not significant at $P < .05$. NS = never smoked; PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance. Percentages refer to percentages of patients within each stage who have (vs. do not have) MDD.

Use of the processes of change for smoking cessation in our psychiatric sample (Table 1) was similar to that found in previous studies. The current sample used behavioral processes increasingly as they moved from the early stages of change (e.g., precontemplation) to the late stages (e.g., maintenance) [$F(4,72) = 3.55$]. Use of experiential processes, however, was high across all stages [$F(4,72) = 0.71$, ns]. From precontemplation to contemplation, the trend was for pros of smoking to decrease and for cons of smoking to increase. Temptations tended to increase from precontemplation to preparation then decrease from preparation to maintenance.

Hypothesis 1 states that psychiatric outpatients who have ever smoked have higher rates of MDD than do those who have never smoked. Data (Table 2) corroborate Hypothesis 1 [Wald $\chi^2(1) = 4.86$], with the odds of never smokers having a current diagnosis of MDD being 51% lower than those of ever smokers (OR = .51).

Hypothesis 2 states that psychiatric outpatients in earlier stages of change have higher rates of MDD and more depressive symptoms than do those in later stages and those who have never smoked. The data on MDD showed little variability across stages of smoking cessation, including the category of never smokers [$\chi^2(5) = 5.91$, ns]. The data on depressive symptoms (as measured by BDI-II total score; Table 3) also showed little variability across stages of smoking cessation, including the category of never smokers [$F(5,199) = 1.32$, ns].

Hypothesis 3 states that psychiatric outpatients in earlier stages of change report less desire for abstinence, less expectation of success at abstinence, greater expected difficulty with abstinence, and lower rates of commitment to total abstinence than those in later stages. The data on desire for abstinence [$F(4,73) = 12.50$], expectation of success [$F(4,73) = 19.61$], and expected difficulty [$F(4,74) = 4.03$], but not on commitment [$\chi^2(4) = 0.25$, ns], corroborated Hypothesis 3 (Table 1).

Table 3
Average scores and standard deviations on BDI-II by stage of change ($N=205$)

	Never smokers ($n=64$)	Current smokers ($n=58$)			Former smokers ($n=83$)	
	NS ($n=64$)	PC ($n=17$)	C ($n=25$)	P ($n=16$)	A ($n=16$)	M ($n=67$)
Total	18.5 (6.1)	18.8 (7.7)	25.5 (7.1)	19.8 (5.7)	17.8 (6.0)	19.1 (5.3)
Somatic	12.0 (12.5)	11.7 (15.7)	15.3 (12.1)	13.1 (12.6)	11.2 (13.7)	12.7 (11.2)
Cognitive	7.5 (7.6)	8.7 (9.7)	11.2 (7.2)	7.5 (8.3)	7.3 (8.3)	7.5 (7.5)

Means appear first, followed in parentheses by standard deviations. One-way ANOVAs [$F(5,199)$] indicated that no comparisons were significant at $P < .05$. NS = never smoked; PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.

4. Discussion

The current study examined the association between depression and stages of change for smoking cessation in a psychiatric outpatient sample. The proportion of current smokers with MDD in our sample was higher than that found in the Hughes et al. (1986) study of psychiatric outpatients (59% vs. 49%). The stage distribution of the current sample included a smaller percentage of current smokers in precontemplation and a larger percentage in preparation as compared to previous studies with nonpsychiatric samples (Velicer et al., 1995). The lower percentage of precontemplators in our outpatient sample may reflect the fact that highly educated people, such as those in our sample, are generally more ready to quit smoking. Alternatively, this discrepancy may reflect the fact that people who have sought therapy, such as those in our sample, are more ready to change aspects of their lives with which they are dissatisfied, including their smoking behavior.

Two other studies of psychiatric samples reported data on readiness to quit smoking and found dramatically higher proportions of participants in precontemplation. In a sample of chronically psychiatrically ill veterans in residential treatment, the proportion in precontemplation (56%) was nearly seven times that found in our sample (8%) (Hall et al., 1995). A sample of psychiatric inpatient current or former smokers were less ready to quit smoking than outpatient current or former smokers in our sample, with a larger proportion in precontemplation (53% vs. 12%) and a smaller proportion in maintenance (9% vs. 47%) (Carosella, Ossip-Klein, & Owens, 1999). This discrepancy may be due to the fact that one needs to have a certain level of functioning in order to consider working toward changing one's smoking behavior.

Patterns of associations among the transtheoretical model constructs in this clinical sample were similar to those observed in studies of the general population. Use of behavioral processes increased from precontemplation to maintenance. Use of experiential processes was high across all stages, perhaps reflecting a direct influence of a therapeutic relationship focused globally on processes such as consciousness raising and self-reevaluation, which may spill over into the context of smoking cessation even when therapy is focused on other issues. Previous studies have demonstrated low use of the change processes among precontemplators and long-term maintainers (Prochaska et al., 1988). Maintainers in our sample, however, had the highest scores of any group on both experiential and behavioral processes, indicating, perhaps, that psychiatric patients must put more effort into quitting smoking than do people in the general population. The distributions of pros and cons of smoking and of temptations to smoke were consistent with transtheoretical model theory. From precontemplation to contemplation, pros of smoking decreased, whereas cons of smoking increased. Temptations to smoke increased from precontemplation to preparation then decreased from preparation to maintenance.

Likelihood of current MDD was significantly associated with smoking status; nonsmokers were 51% less likely to be diagnosed with MDD than were patients who had ever smoked. Given the trends in the data, it is possible that the hypothesis of an association among depression and stage of change for smoking cessation (Hypothesis 2) would have been corroborated in a slightly larger sample. Data supporting Hypothesis 3 demonstrate that thoughts about abstinence are an important construct in smoking cessation.

The only evidence regarding the theoretical link between depression and stages of change was a trend toward elevation of contemplators on BDI-II total score. This trend could be attributed to the dread felt by smokers who are contemplating quitting in the next 6 months. In particular, such people may be ruminating over the prospect of quitting without actually taking action, and such rumination is thought to perpetuate depression (Nolen-Hoeksema, 1991). In addition to this dread, they may feel dejection over the discrepancy between their ideal goal for abstinence and their actual behavior (Higgins, 1987), and such dejection seems logically related to depression.

Limitations of the present study include self-report measurement of depression, retrospective report measurement of thoughts about abstinence and processes of change, and use of a volunteer sample of convenience. Strengths include use of a relatively large sample of psychiatric outpatients and assessment of all constructs of the transtheoretical model of change.

This study has implications for designing interventions for smokers in treatment. Knowledge of a patient's stage of change for smoking cessation can inform use of treatment techniques. Providers can use stage of change assessments to identify the optimum time for intervening on patients' smoking behaviors. Inpatients and those who are more chronically and severely disturbed appear to be most resistant to quitting and are more likely to be found in precontemplation. Outpatients seeking treatment for mental health concerns may also be interested in working toward smoking cessation, and their motivation for change should be assessed. Promotion of experiential processes of change (e.g., self-reevaluation) among patients in the earlier stages of change and behavioral processes (e.g., counterconditioning) in the later stages has been shown effective (Prochaska et al., 1993). To move patients from precontemplation to contemplation, the cons of smoking should be emphasized over the pros of smoking. Smoking cessation interventions that are tailored to a patient's stage of readiness to change are most likely to speed patients along toward long-term abstinence from smoking.

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