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Relationship of perceived risks of smoking cessation to symptoms of withdrawal, craving, and depression during short-term smoking abstinence

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Abstract

The current study examined the relationship between perceived risks of quitting smoking and the self-reported experience of risks (e.g., cravings) during short-term abstinence. Participants (n = 55) were daily smokers enrolled in a study of contingency management for smoking cessation with biochemically confirmed abstinence for one week. Participants were divided into groups of higher and lower perceived risk of quitting. There were no differences by risk group in demographics or baseline smoking, nicotine dependence, cravings, withdrawal, and depression. Although participants with higher levels of perceived risks reported a similar pattern of cravings and withdrawal symptoms during abstinence, they experienced higher levels of cravings, withdrawal symptoms, and depression than participants with lower risk beliefs. There were no differences in the relationship of risk to withdrawal symptoms by gender. Smokers with higher levels of perceived risk may find it more difficult to quit and remain abstinent due to higher levels of anticipated or experienced withdrawal symptoms and may benefit from targeted behavioral interventions with regard to risk perception and enhanced coping with withdrawal and other effects of smoking cessation.

Keywords

smoking; abstinence; withdrawal; depression; cravings

1. INTRODUCTION

Perceived risks associated with smoking cessation (e.g., inability to manage negative affect) have been shown to be negatively related to motivation to quit, and treatment outcome (McKee et al., 2005; Toll et al., in press). Perceived risks associated with smoking cessation include concern about weight gain, inability to manage negative affect, anticipated negative withdrawal symptoms, loss of enjoyment, and social ostracism (e.g., Curry et al., 1990). Although these

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perceived risks represent barriers to successful treatment and may be a useful target for interventions, few studies have examined the relationship of perceived risks of smoking cessation to abstinence-related variables and it is unclear how these beliefs related to a smoker's experience during smoking cessation. The current study prospectively examined the relationship between perceived risks and self-reported experience of risks during short-term abstinence.

2. METHODS

2.1 Participants & Procedures

This report is based on an analysis of smokers participating in a study assessing the effects of acute abstinence during a one-month smoking cessation program combining contingency management with cognitive-behavioral therapy (Krishnan-Sarin, 2005). Assessments were completed on days 0 (day before quit day), 1 (end of quit day), and 8. We included participants who reported no smoking at any point during the week and had expired breath carbon monoxide (CO) levels of <10ppm on Days 1 and 8. Forty-seven percent of the 116 subjects (n=55; 56% female; 68% Caucasian) were confirmed to be abstinent and had outcome data. All procedures for this study received approval from the Institutional Review Board of Yale University School of Medicine.

2.2. Measures

2.2.1. Assessment of Smoking and Nicotine Dependence—Smoking abstinence was assessed through self-report and CO levels. The Fagerström Test for Nicotine Dependence (FTND; Heatherton et al., 1991), a 6-item measure of nicotine dependence (range 0–10), was administered at baseline.

2.2.2. Perceived Risks and Benefits Questionnaire (PRBQ)—The PRBQ (McKee et al., 2005), an 18-item measure, was used to assess risks for smoking cessation (Weight Gain, Increase in Negative Affect, Difficulty Attending or Concentrating, Social Ostracism, Loss of Enjoyment, Craving) on a Likert Scale (1=no chance, 7=certain to happen). An overall mean perceived risk score was calculated as were mean scores for each of the risk subscales.

2.2.3. Nicotine Withdrawal and Craving and Depression—The 8-item Minnesota Nicotine Withdrawal Scale (M-NWS; Hughes and Hatsukami, 1986) was used to assess symptoms of tobacco withdrawal (range 0–32). The Tiffany Questionnaire of Smoking Urges (T-QSU; Tiffany and Drobes, 1991) was used to evaluate urges to smoke in response to positive (Factor 1) or negative (Factor 2) reinforcement (range 1–7). The 20-item Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used to assess depressive symptomatology (range 0–60).

2.3. Statistical Methods

A median split was used to divide participants into two groups: 1) High Perceived Risk for Quitting (High Risk, n=27, M=5.14, SD=0.61) and 2) Low Perceived Risk for Quitting (Low Risk, n=28, M=3.36, SD=0.79). Independent sample t-tests and chi-square tests were used to compare the two risk groups on demographic and smoking variables. For symptoms of nicotine withdrawal, craving, and depression, repeated measures analysis of variance (ANOVA) were conducted with risk (high/low) as a between-subjects variable and time (Day 0, 1, 8) as a within-subject variable. Simple effects analyses consisted of paired comparisons of risk status (High Risk, Low Risk) within the three time-points (Day 0, 1, 8). Repeated measure ANOVAs were performed using the median splits of each of the individual risk subscales of the PRBQ. All described analyses were repeated to include gender as a between-subject variable.

3. RESULTS

3.1. Baseline demographics and measures of smoking

Abstinent participants in the High and Low Risk groups did not differ on any demographic or smoking variables (all *p*s>0.05, see Table 1), nor were there any differences on Day 0 values of craving, withdrawal, or depression (all *p*s>0.05, see Figure 1).

3.2. Risk Perception and Cravings

There was a main effect of risk perception for Factor 1 and 2 of the T-QSU (Factor 1 $F(1,36)=5.01$, $p<0.05$, Figure 1A; Factor 2 $F(1,33)=13.58$, $p=0.001$, Figure1B). Participants with higher perceived risks of smoking cessation reported higher levels of cravings related to positive and negative reinforcement. There was also a main effect of Time for both factors (Factor 1 $F(2,35)=11.43$, $p<0.001$, Figure 1A; Factor 2 $F(2,32)=11.18$, $p<0.001$, Figure1B). Cravings related to positive reinforcement decreased during the week while cravings related to negative reinforcement increased on the first day of abstinence then decreased by the end of the week. The Risk × Time interaction was not significant.

3.3. Risk Perception and Nicotine Withdrawal Symptoms

There was a main effect of risk perception for the M-NWS ($F(1,37)=5.24$, $p<0.05$, Figure 1C). Participants who reported greater risk beliefs reported higher levels of withdrawal symptoms during abstinence from smoking. There was also a main effect of Time for the M-NWS ($F(2,36)=10.88$, $p<0.001$, Figure 1C). All participants reported an increase in withdrawal symptoms on the first day of abstinence which then decreased by the end of the week. The Risk × Time interaction was not significant.

3.4. Risk Perception and Depression

There was a significant Risk × Time interaction ($F(2,56)=3.63$, $p<0.05$, Figure 1D). For participants with high risk, symptoms of depression increased from the quit day to the end of the week. Depression symptoms remained constant over the week for participants with low risk.

3.5. Differences in Cravings, Withdrawal, and Depression by Risk Subscale and Gender

When analyses were conducted using the subscales of the PRBQ, the results did not substantially change from the pattern found using the overall risk score (reported above). In addition, the relationship between risk score and cravings, withdrawal, and depression did not significantly differ by gender.

4. DISCUSSION

Treatment seeking smokers with higher risk perceptions reported elevated levels of cravings, withdrawal, and depression symptoms, which may explain why smokers with higher levels of risk perception have poorer smoking cessation outcomes (e.g., McKee et al., 2005). It is unclear whether participants with higher risk perceptions experience a greater absolute level of withdrawal during abstinence or if these participants are subjectively more sensitive to abstinence effects. Either the experience or expectation of uncomfortable symptoms may make it more difficult to maintain smoking abstinence.

Unlike craving and withdrawal symptoms, which returned to baseline levels, symptoms of depression increased during brief abstinence for participants with higher risk perceptions. Increased negative affect may represent a barrier to long-term abstinence for these smokers as negative affect has been related to smoking relapse (Piasecki, 2006).

4.1. Limitations

Limitations of the study included those related to the sample who entered the study agreeing to attempt to quit smoking without medication and were able to remain abstinent for a full week. Further research should examine the relationship between risk beliefs and tobacco abstinence effects in participants unable to quit smoking or using pharmacological cessation agents. Data from the first week of smoking abstinence was used for the current analysis to examine the relationship between risk perceptions and experience of severe withdrawal symptoms. It may be of interest to examine this relationship over an extended period of time in future research.

4.2. Conclusions

Beliefs associated with the risks of smoking cessation affect smokers' motivation to quit, time to relapse, and the report of craving, withdrawal symptoms, and negative affect during a quit attempt. Future research can examine whether interventions focusing on strategies to prepare for and cope with anticipated adverse abstinence effects prior to a target quit date would aid smokers with high risk perceptions in dealing with withdrawal symptoms and abstinence-related negative affect to prevent relapses to smoking.

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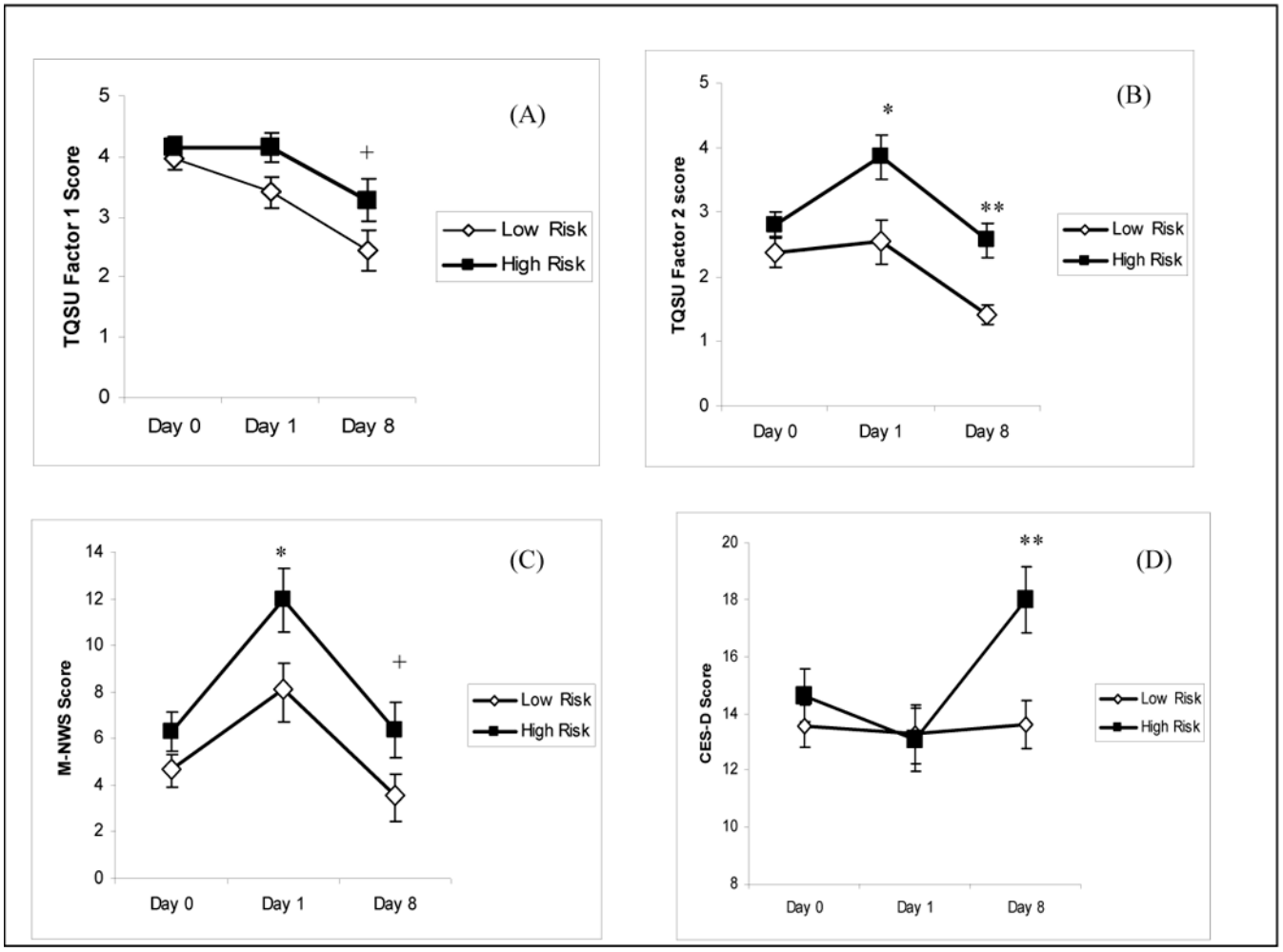

Figure 1.

Changes in report of cravings, nicotine withdrawal symptoms, and symptoms of depression by risk group over one week of abstinence as measured by the T-QSU Factor 1 (A), T-QSU Factor 2 (B), M-NWS (C), and the CES-D (D).

Paired comparisons of Low Risk vs High Risk within timepoints ** $p<0.001$, * $p<0.05$, + $p<0.10$

Table 1

	High Risk (n=27)	Low Risk (n=28)
Gender	9M/18F	15M/13F
Age	40.50 ± 9.95	42.32 ± 10.32
Ethnicity	18C/9O	17C/11O
Age of first cigarette	15.07 ± 3.08	14.54 ± 3.20
Age of regular smoking	17.22 ± 2.82	16.00 ± 3.04
CPD	24.44 ± 11.80	21.93 ± 8.92
Duration of smoking	17.58 ± 10.34	19.17 ± 11.78
Number of quit attempts in past year	1.65 ± 1.50	1.08 ± 1.38
FTND	6.11 ± 2.31	6.21 ± 1.97

Key: CPD, cigarettes per day; FTND, Fagerström Test of Nicotine Dependence; M, male, F, female; C, Caucasian, O, Other