Original Investigation

Postquitting experiences and expectations of adult smokers and their association with subsequent relapse: Findings from the International Tobacco Control (ITC) Four Country Survey

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Abstract

Introduction: This paper explores postquitting experiences and expectations of adult ex-smokers and their utility as predictors of smoking relapse after prolonged abstinence.

Methods: Data are from 1,449 ex-smokers (providing 2,234 observations) recruited as smokers as part of the International Tobacco Control (ITC) Four Country Survey (Australia, Canada, the United Kingdom, and the United States) but surveyed after they had quit. Controlling for length of time quit, reported post quitting experiences, and expectations assessed at one of three waves were used as predictors. Smoking status (whether they had relapsed) at the next wave was used as the outcome of interest.

Results: Postquitting experiences and expectations, such as capacity to enjoy life's simple pleasures, ability to cope with stress, ability to control negative emotions, and health concerns, changed systematically over time but at different rates. The trajectory of change for life enjoyment and health concerns followed a rapidly asymptoting logarithmic function, while that of stress and negative affect coping followed a slower asymptoting square root function. After controlling for sociodemographic and abstinence duration, only reported decline in capacity to control negative affect since quitting was associated with increased relapse risk.

Discussion: The varying patterns of change in postquitting experiences suggest that psychological gains over time following smoking cessation do not all occur at the same rate. The relative importance of each factor in maintaining abstinence is also not the same with deficits in perceived control of negative emotions being the only one predictive of subsequent relapse. Strategies to improve impulse control over negative emotions postquitting may help to reduce relapse risk.

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Introduction

Quitting is difficult for most smokers, and most quit attempts end in relapse (Carmody, 1992; Hughes, Keely, & Naud, 2004; Lancaster, Hajek, Stead, West, & Jarvis, 2006). Previous research has shown that postquitting experiences may be important determinants of relapse (Allen, Bade, Hatsukami, & Center, 2008; Carmody; Cummings, Jaen, & Giovino, 1985; Gilbert & Warburton, 2003; Wewers, 1988). This is consistent with Rothman's model of health behavior change (Rothman, Baldwin, & Hertel, 2004; Rothman, Hertel, Baldwin, & Bartels, 2008), which argues that the continuation of a new behavior is predicated on the perceived satisfaction with the outcomes afforded by the new behavior. In contrast, the initiation of the new behavior is precipitated by the anticipated benefits of the new behavior. In the context of smoking behavior, what often lead smokers to make a quit attempt are the anticipated benefits of quitting. However, expected health benefits of quitting are often not directly experienced especially in the short term, while any losses or other negative experiences associated with quitting are (Hughes, 2006; U.S. Department of Health and Human Services [U.S. DHHS], 1990).

Previous research has shown that during the first 2–3 weeks of quitting, smokers generally experience nicotine withdrawal symptoms, which tend to diminish over time and are typically resolved by the fourth week of quitting (Cummings et al., 1985; Hughes, 1992; McCarthy, Piasecki, Fiore, & Baker, 2006; Piasecki, Fiore, & Baker, 1998; U.S. DHHS, 1990). Beyond this initial phase where cravings and temptations to smoke are strong, the challenge changes from having to struggle to stay quit to a focus on becoming comfortable being a nonsmoker (Segan, Borland, Hannan, & Stillman, 2008). This is likely to involve the need to develop alternative ways of gaining pleasures associated with smoking and learning ways of coping with life's stressors and negative feelings that do not rely on cigarettes. This paper focuses on experiences and beliefs that may persist well beyond the period of withdrawal.

There are still relatively few studies that have examined the time course of postquitting experiences particularly those that are beyond the initial period of withdrawal, and how changes in these experiences might be related to long-term relapse. Previous reviews of long-term abstinence effects suggest that there are some postwithdrawal psychological benefits that may increase with duration of quitting that include a reduction in levels of perceived stress (Parrott, 2006), improved self-esteem, and increased use of skills to cope with stress and with temptations to smoke (U.S. DHHS, 1990). Consistent with this, a recent cross-sectional study by Shahab and West (2009) found that the majority of ex-smokers reported feeling happier than when they were smoking. A recent prospective study by Herd and Borland (2009) using data from the ITC 4-country project, a large population-based study from four countries, indicated that postquitting beliefs and expectations change as a function of abstinence duration following either a logarithmic or a square root function, suggesting that the rates of change for these beliefs and experiences are not always the same. In a companion paper, Herd, Borland, and Hyland (2009) were able to demonstrate that only some of these beliefs, expectations, and experiences assessed postquitting predict subsequent relapse. Frequency of urges to smoke and low-abstinence self-efficacy were both strong predictors of relapse, and both of these factors mediated the positive relationships between perceived benefits of smoking and relapse. They also found that the predictive effect of urges to smoke really only emerged after a couple of weeks after quitting, suggesting that it is less important in the period of withdrawal than later on. They found that some experienced losses from quitting predicted relapse, but expectations about health gains from staying quit and reported overall quality of life since quitting did not predict relapse.

In an effort to identify additional predictors of relapse, we sought to extend this work (Herd & Borland, 2009; Herd et al., 2009) by examining other measures of experiences and expectations of quitters using data from a partially overlapping sample collected at subsequent waves of the ITC-4 country project. Our sample did not include data from Waves 1 and 2 as our measures of interest, not considered by Herd et al., were only asked from Wave 3 onwards, and we also had an additional wave (Wave 6) not included in Herd et al. Specifically, our study aimed to explore the extent and predictive value for relapse/quit maintenance of (a) reported changes in capacity to enjoy life's simple pleasures, (b) ability to cope with stress and control negative emotions, and (c) reported concerns about future smoking related illness despite having quit. Based on the findings of Herd et al., we hypothesized that reported postquitting gains in life enjoyment and coping with either stress or negative emotions would be associated with sustained abstinence. We did not have any clear prediction for reported concerns about future health, although we suspected that these would be associated with increased relapse risk if they were an indication of ongoing concern that the damage has already been done, and therefore, it is too late to lessen the impact on future health rather than as a continuing motivation to stay quit.

Method

The International Tobacco Control Four Country Survey (ITC-4) is a prospective cohort study of a broadly representative sample of over 2,000 adult smokers (18 years and older who reported

smoking at least 100 cigarettes in lifetime) conducted in each of four countries: Canada, the United States, the United Kingdom, and Australia. Participants were recruited via random digit dialing telephone interviews and followed up annually. Additional participants were recruited yearly to replace those lost to attrition. A detailed description of the aims and methods of the ITC Project can be found in Thompson et al. (2006).

Participants

Participants were ex-smokers who were present in at least one survey wave of Waves 3, 4, and 5 of the ITC-4 Survey (1,449 unique individuals providing 2,234 observations) and who also reported smoking status at the next wave (Waves 4, 5, and 6). Participants who were quit at multiple waves contributed multiple response sets: 880 participants contributed one set, 353 contributed two, and 216 contributed to three, totaling 2,234 sets of responses across the four waves. Beliefs and reported experiences taken from Waves 3, 4, and 5 were used to predict smoking status at the following wave. All predictors, except sociodemographics and Heaviness of Smoking Index (HSI), were assessed while participants were quit. Table 1 presents the sample characteristics for all observations by wave used for this study.

Measures

This study examines four predictors of relapse introduced into Wave 3 of the ITC survey and thus not considered by Herd et al. (2009).

Postquitting life enjoyment was assessed using the question: "Since you quit, has your capacity to enjoy simple pleasures of life improved, gotten worse or stayed the same?"

Postquitting emotional coping was assessed using two questions: "Since you quit, has your ability to calm down when you feel stressed or upset improved, gotten worse or stayed the same?", designed to assess capacity to recover from a negative event (stress recovery), and "Since you quit, has your ability to control feelings like anger, grumpiness or annoyance improved, gotten worse or stayed the same?", designed to assess impulse control over negative affect.

Postquitting health concerns was determined using a single question: "How worried are you that, even though you quit smoking, you will still get some smoking-related illness in the future?" with response options: *not at all worried* (1) to *very worried* (4).

Other covariates

The following are included as covariates: age, sex, country, quit duration in days, whether they used any stop-smoking medications since the last survey (yes/no), reported nicotine dependence using the HSI (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989) assessed at last smoking wave, and wave recruited into the study. We also included a composite measure of perceived stress using two items ($r = .56$) taken from Cohen's four-item scale (Cohen, Kamarck, & Mermelstein, 1983): "How often have you felt that you were unable to control the important things in your life?" and "How often have you felt difficulties were piling up so high that you could not overcome them?" with response options "never" to "very often" on a 5-point rating

Table 1. Sample characteristics based on all observations ($n = 2,234$) provided by 1,449 ex-smokers by wave

	Wave 3, $n = 607$	Wave 4, $n = 756$	Wave 5, $n = 871$	Total, $n = 2,234$
Age in years (%)				
18–24	3.1	2.7	3.0	2.9
25–39	31.5	25.9	25.8	27.4
40–54	33.7	34.4	35.6	34.7
55+	31.6	37.0	35.6	35.0
Sex (%)				
Male	44.3	41.5	42.8	42.8
Country (%)				
Unites States	16.3	19.7	18.4	18.3
Canada	26.4	25.1	24.5	25.2
United Kingdom	26.5	26.2	25.4	25.9
Australia	30.8	29.0	31.8	30.6
Heaviness of Smoking index				
Mean (SE)	1.92 (0.06)	1.98 (0.05)	1.99 (0.05)	1.97 (0.03)
Use of stop-smoking medication (% yes)	33.7	31.2	26.0	29.9
Quit duration in days				
<1month	18.3	10.8	13.1	13.7
1–6months	27.8	20.6	20.2	22.4
>6months	53.9	68.6	66.7	63.9
Median (interquartile range)	180 (300)	300 (557)	330 (643)	254 (479)

Note. Percent reported in Waves 4 and 5 include continuing quitters from previous waves.

scale. The mean of the two items was used in the analyses. In addition, we also included the two measures identified by Herd et al. (2009) to be the mediational pathways to relapse, frequency of urges to smoke, and abstinence self-efficacy.

Key outcome variable

Smoking status outcome at each wave was determined by asking participants if they were still quit and how long they had been quit for. Participants who reported they were back smoking and those reporting a period of smoking between surveys were considered to have relapsed.

Statistical analysis

All analyses were conducted using Stata 10 SE. Generalized estimating equation (GEE) models were fitted to the data (Liang & Zeger, 1986). The GEE models control for the fact that respondents could provide up to three datapoints for the predictor variable, allow for cases with other forms of missing data to be included, and also can account for the correlated nature of the data. An unstructured within-subject correlation structure was used. For dichotomous outcome variables, a binomial distribution with logit link function was employed, whereas a Gaussian distribution with identity link function was used for continuous outcome variables in our GEE models. As in Herd and Borland (2009), we explored the relationship between abstinence duration and each of the measures of postquitting experiences and expectations using both logarithmic (log base 10) and square root representation of time for duration of abstinence. The rate of change for logarithmic and square root functions decreases over time with logarithmic function plateauing much sooner than a square root function. For ease of interpretation, we treated the postquit measures with ordinal responses as a quasi-continuous measure and employed linear regression models to examine the

relationship between duration of abstinence and each of the postquit measures. Controlling for sociodemographics, we tested for both linear and nonlinear trends, the latter using a squared duration of abstinence term. Model building for relapse prediction proceeded in stepwise fashion starting with an initial exploration of relationships between each predictor variable and smoking status at the following wave, then followed by adding into the model potential confounders, such as sociodemographic variables and duration of abstinence. We also examined possible moderating effects by adding interaction terms between proposed predictors and potential moderators such as duration of abstinence, country, and use of stop-smoking medications into the model.

Results

Sample characteristics

From Table 1, the pattern of distribution for age group, gender, and country is very similar across the three waves. Reported use of stop-smoking medications was 33.7% at Wave 3 but was lower in Waves 4 and 5 (31.2% and 26.0%, respectively). This was largely due to an increase in percentage of those who had quit for more than 6 months from just over half in Wave 3 to more than two thirds in Waves 4 and 5.

Postquitting experiences and expectations by quit duration

Table 2 presents the results of linear regression analyses examining the relationship between quit duration and each of the postquit measures, indicating that postquitting experiences and expectations do not change in the same way over time, with some changing according to a logarithmic function and

Table 2. Relationships between duration of abstinence and postquitting experiences and expectations

Dependent measures	Fn	Days quit (fn)			Days quit (fn) squared		
		Coeff.	95% CI	p Value	Coeff.	95% CI	p Value
Life enjoyment	Log	.11	0.08–0.14	<.001	NA	NA	NA
Stress recovery	Log	−.02	−0.17 to 0.14	0.82	.04	0.004–0.086	<.05
	Square root	.02	0.02–0.03	<.001	−.0004	−0.0006 to −0.0001	<.01
Negative affect control	Log	.11	−0.04 to 0.25	0.14	.02	−0.02 to 0.06	.32
	Square root	.03	0.02–0.03	<.001	−.0004	−0.0006 to −0.0002	<.01
Future health concerns	Log	−.10	−0.15 to −0.05	<.001	NA	NA	NA

Note. For ease of interpretation, linear regression instead of ordinal logistic regression analyses was conducted where the dependent variables (all ordinal measures) were treated as quasi-continuous measures. Models adjusted for age, sex, country, survey wave, and recruitment wave. For each dependent variable, results from one of two models were reported: model with quit duration alone or model with both quit duration and its squared term. Coeff. = regression coefficients; Fn = function; NA = not applicable given that the model with quadratic term showed no significant effect.

others according to a square root function. As shown in Figure 1a, reported life enjoyment showed a significant log-linear increase with duration of abstinence (linear estimate = 0.11, 95% CI = 0.08–0.14, $p < .001$), suggesting that the increase in life enjoyment asymptotes over time. By the first 7 days of quitting, 38.4% of participants reported an improvement in life enjoyment, and this increases to 59.9% by 1 year or more of abstinence.

As can be seen in Table 2, the relationship between stress recovery and duration of abstinence is better captured by the square root function with both the linear and quadratic effects being significant, whereas only the quadratic effect is significant for the log function. Overall, reported ability to cope with stress improved with duration of abstinence, but the rate of improvement was more rapid initially and decelerated over time (see Figure 1b). By the first week of quitting, 22.8% of participants

Figure 1. Reported change in postquit experiences and expectations by duration of abstinence: best-fitting regression lines with 95% CIs in shaded area.

reported their stress coping being worse off as compared with 17.1% reporting an improvement. However, by a year or more of abstinence, only 13.1% reported being worse, while 29.5% reported an improvement.

As for negative affect control, log transformation of quit duration yielded nonsignificant results for both the linear and quadratic effects, whereas both were significant for the square root function (see Table 2), suggesting that the pattern of improvement over time was similar to that of stress recovery, although the actual rate of change differs between the two. While it requires at least about 100 days of abstinence before a greater proportion of participants reported an improvement in ability to cope with stress (see Figure 1b), it requires about 182 days or more to observe the same for an improvement in ability to control negative emotions (see Figure 1c).

Unlike the others, future health concerns showed a significant log-linear decline with time quit (see Figure 1d), but two thirds (66.3%) of participants were still reporting being worried by a year or more of abstinence.

Postquitting experiences and expectations in predicting relapse

Table 3 presents the results of the GEE analysis predicting relapse at the next wave. The GEE models indicate that after controlling for sociodemographics, the effect of life enjoyment and both measures of emotional coping were significantly and linearly associated with relapse such that those who reported an improvement were less likely, while those who reported a decline were more likely, to relapse as compared with those who reported no change in these experiences postquitting. When

quit duration was added into the model, the significant effect of both improved life enjoyment and stress recovery on relapse became marginal. The significant effect of worsening negative affect control on relapse was attenuated but remained significant. These results show the importance of controlling for time quit (Model 2 in Table 3) when the measures systematically change with time. When we controlled for other covariates, such as HSI, medication use, and perceived stress (only for the two coping measures), the effect of life enjoyment and the two coping measures on relapse did not change substantially (not shown). Use of stop-smoking medications was significantly related to relapse for all postquit measures (life enjoyment: odds ratio [OR] = 1.48, 95% CI = 1.14–1.93; stress recovery: OR = 1.48, 95% CI = 1.14–1.92; negative affect control: OR = 1.46, 95% CI = 1.12–1.89; and health concerns: OR = 1.47, 95% CI = 1.13–1.91), but none was found for perceived stress and HSI.

We next examined the potential mediating role of frequency of urges and abstinence self-efficacy for the impact of negative affect control and found that the effect of deficits in impulse control over negative affect on relapse was further attenuated and became nonsignificant after adding in frequency of urges and abstinence self-efficacy (OR = 1.12, 95% CI: 0.84–1.50). Given the two coping measures were highly correlated ($r = .64$, $p < .001$), we combined them into a scale by taking the average and repeated the analyses and found a similar trend as that of the individual measures. Improved coping was negatively related to relapse, remaining significant after controlling for sociodemographics (OR = 0.70, 95% CI: 0.59–0.84) but became marginal after controlling for quit duration (OR = 0.89, 95% CI: 0.73–1.09). Future health concerns showed a positive association with relapse but was not significant in all our models.

We also looked for possible moderation of effects by quit duration, country, and use of stop-smoking medications and found all were nonsignificant except one. A significant interaction between stress coping and medication use was found with those reporting an improvement in stress recovery capacity being marginally more likely to relapse if they reported having used stop-smoking medications ($p = .07$) but significantly less likely to relapse if they did not ($p < .05$; see Table 4).

Table 3. Generalized estimating equation models predicting relapse at the next wave ($n = 2,234$, n clusters = 1,449)

Predictors at Wave $N - 1$	Relapse at Wave N , AOR (95% CI)	
	Model 1	Model 2
Postquit experiences		
Life enjoyment		
Improved	0.81 (0.66–0.99)	1.05 (0.84–1.33)
Same	Reference	Reference
Worse	1.33 (0.81–2.18)	1.46 (0.85–2.50)
Stress recovery		
Improved	0.76 (0.59–0.97)*	0.86 (0.64–1.15)
Same	Reference	Reference
Worse	1.23 (0.96–1.58)	1.01 (0.76–1.35)
Negative affect control		
Improved	0.86 (0.67–1.11)	1.09 (0.81–1.47)
Same	Reference	Reference
Worse	1.63 (1.28–2.09)**	1.33 (1.00–1.76)*
Postquit expectations		
Future health concerns	1.05 (0.95–1.17)	1.03 (0.92–1.16)

Note. AOR—ORs for Model 1 adjusted for age, sex, country, survey wave, and recruitment wave and ORs for Model 2 adjusted for quit duration. AOR = adjusted odds ratio; OR = odds ratio.

*Significant at $p < .05$; ** $p < .001$.

Discussion

Three main findings emerge from this study. First, among smokers who had quit smoking, perception of an improvement in postquitting experiences, such as capacity to enjoy life's simple pleasures, ability to calm down when stressed or upset, and ability to control negative emotions, increased over time but at different rates. Second, reported improvement in postquitting experiences such as life enjoyment and coping with stress were not associated with subsequent relapse back to smoking but reported deficits in impulse control after quitting smoking was. Third, and of more concern, many continued to worry about getting a tobacco-related disease in the future despite having quit. Each of these findings is discussed in turn.

Similar to what Herd and Borland (2009) found for other smoking-related beliefs and experiences, changes in reported post quitting experiences such as life enjoyment, coping with stress,

Table 4. Results showing the interaction between stress recovery capacity and stop-smoking medication use^a on relapse

Predictors at Wave N – 1	Relapse at Wave N, AOR (95% CI)
Stress recovery (by medication use)	
For medication users:	
Improved	1.49 (0.93–2.38)
Same	Reference
Worse	1.18 (0.74–1.88)
For medication nonusers:	
Improved	0.59 (0.39–0.88)*
Same	Reference
Worse	0.92 (0.63–1.35)

Note. ^aSince last survey date. AOR = adjusted odds ratio.

*Significant at $p < .05$; AOR—odds ratios adjusted for age, sex, country, survey wave, recruitment wave, and quit duration.

and negative affect asymptote quickly over time (logarithmic or square root trajectory) and that the changes are not all at the same rate. For life enjoyment, changes follow a log-linear function, suggesting a rather rapid change initially that asymptotes quickly over time, whereas for the two coping measures, they follow a square root function, indicating a much slower rate of change (as compared with a log function), and there is evidence that changes decelerate over time (as indicated by the significant square root quadratic effect). Consistent with previous research (Herd & Borland, 2009; Shahab & West, 2009), the finding that perceived overall quality of life improved over time since quitting suggests that for most quitters, it is possible to derive increased pleasure from activities apart from smoking. That is, far from quitting being experienced as a net loss of immediate life satisfaction, it enhances it. It is unclear why a minority of smokers would experience a loss in life enjoyment postquitting even after being quit for a year or more. Work from animal studies has provided evidence to suggest that nicotine, being only a weak primary reinforcer, can also serve to enhance the reinforcement value of stimuli commonly associated with smoking (Chaudhri et al., 2006; Palmatier et al., 2007), and hence, even after quitting for sometime, the presence of such conditioned stimuli may make it difficult for some to find enjoyment in activities apart from smoking.

It is not surprising that perceived gains in coping were relatively small initially following cessation but improved over time as quitting is generally more stressful and creates more emotional turmoil in the first 2–3 weeks because of withdrawal symptoms (McCarthy et al., 2006; Piasecki et al., 1998). Of note is the finding of a longer period of abstinence needed for negative affect control than for stress recovery before a greater proportion of ex-smokers would perceive a gain in coping ability, suggesting that any negative affect such as anger and irritability engendered as part of the withdrawal syndrome may persist for longer before it begins to abate as compared with difficulty coping with stressful events.

After controlling for time quit at assessment, we found that a worsening of impulse control (over negative affect), but not stress coping, predicted subsequent relapse. The greater susceptibility of those with problems in impulse control over negative affect

could be because negative affect may be more likely to occur without warning, and thus, there is less capacity to marshal coping resources. It might also be that the internal turmoil is more threatening than the challenge of dealing with more external stressors. If indeed it is reduced impulse control of negative affect that is critical, then it would suggest a common mechanism for relapse—that relapse is a result of reduced capacity to inhibit an impulse to act, thus being more likely to succumb to a craving or to explode when annoyed (VanderVeen, Cohen, Cukrowicz, & Trotter, 2008). This notion is consistent with the finding that deficits in impulse control appear to exert an influence on relapse through increasing urges to smoke and decreasing quitters' perceived self-efficacy to stay quit. It would be interesting to explore whether the capacity to inhibit an impulse to act is a personality trait (Anestis, Selby, & Joiner, 2007) or is related to the rate of recovery from the dependence on nicotine (Dawkins, Powell, West, Powell, & Pickering, 2007) and thus be expected to improve over time. From an intervention point of view, these findings suggest that smokers who quit may benefit from some cognitive behavioral counseling to learn more effective coping strategies, in particular ones that will improve impulse control as part of relapse prevention.

One curious and unexpected finding was the fact that reported gain in stress recovery capacity since quitting was protective of relapse only among those who had not reported using any stop-smoking medication in the last year, while those who had appear to be more vulnerable to relapse despite reporting a gain in stress recovery capacity. It may be that medication users were more likely to either attribute any gain in stress coping to the effects of medication (an external factor) and/or rely on medications for coping and recovery, thus increasing their relapse risk when they stop using medications or because these products are not always readily accessible when needed. By contrast, those not using any medications would have to attribute any gains in stress recovery capacity to some other coping strategies (possibly those more internally based) or develop more effective ones that help to reduce their relapse risk.

It is notable that two thirds of the quitters in our study who had quit for a year or more reported that they were still worried about the possibility of getting tobacco-related diseases in the future despite having quit. However, there is no evidence that quitters who continued to hold such view had an increased risk of future relapse. The high prevalence of such perception among quitters may not be that surprising given that such benefits of quitting would likely take years to realize and are not obvious in the short to medium term and that for some diseases risk never returns to that of a nonsmoker.

We were able to replicate, in both our bivariate and multivariate analyses using a partially overlapping sample, the finding of Herd et al. (2009) on the lack of a relationship between HSI and relapse risk. This finding is different to that found by Hyland et al. (2006) where the same behavioral measure of dependence was a strong predictor of quit success among those who tried. The apparent disparity in findings may be due to the presence of lots of brief attempts in the Hyland et al. sample as opposed to the predominance of much more sustained attempts in our study. This would suggest that prequit measure of dependence, such as the HSI, is predictive of outcome of short-term, but not long-term, quit attempts, something that deserves further research.

Limitations

There are several limitations worth a mention. First, the sample reported here are primarily those quit for some time. Thus, the findings may not generalize to short-term relapse. Second, relapse was assessed over a year from measurement of the predictor variables, and this might explain the weak and inconsistent relationships between the predictors and outcome. Future studies are needed with shorter and multiple follow-ups. Third, the weak relationships with outcome could be an artifact of the difficult task of making relative judgments about change. However, questions based on temporal comparison have been used successfully as predictors of relapse in other studies (Dijkstra & Borland, 2003; Dijkstra et al., 2007). According to Temporal Comparison Theory (Albert, 1977), temporal comparisons are central in the motivation to stay abstinent in ex-smokers particularly in times of uncertainty. Those who have quit smoking may want to assess whether abstinence pays off to help decide whether it is worthwhile continuing to put in effort required to stay off cigarettes. Fourth, it is unclear what strategies (beside stop-smoking medications) people are using to cope with stress and/or control negative affect and how effective they are as we have no measure of the effectiveness of strategies used.

Conclusions

Smokers can be reassured that most will experience significant gains in life enjoyment and coping capacity following smoking cessation and that such gains will improve with time quit, although the rate at which they occur varies. However, such gains may not protect them from future relapse risk. Any perceived loss in capacity to control negative affect following cessation is likely to increase their risk of long-term relapse. Strategies to enhance impulse control of negative emotions without the use of cigarettes may help to reduce relapse risk after prolonged abstinence.

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Declaration of Interests

None declared.

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