Full length article

Development and initial validation of a cessation fatigue scale

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ARTICLE INFO

ABSTRACT

Background: Smoking cessation fatigue, or tiredness of attempting to quit smoking, has been posited as a latent construct encompassing loss of motivation, loss of hope in cessation success, decreased self-efficacy, and exhaustion of self-control resources. Despite the potential clinical impact of characterizing cessation fatigue, there is currently no validated measure to assess it. Using a rational scale development approach, we developed a cessation fatigue measure and examined its reliability and construct validity in relation to a) smokers' experience of a recently failed quit attempt (QA) and b) readiness to engage in a subsequent QA.
Methods: Data were drawn from an online cross-sectional survey of 484 smokers who relapsed from a QA within the past 30 days.
Results: Exploratory factor analysis identified three factors within the 17-item Cessation Fatigue Scale (CFS), which we labeled: emotional exhaustion, pessimism, and devaluation. High internal consistency was observed for each factor and across the full scale. As expected, CFS overall was positively associated with withdrawal severity and difficulty quitting. CFS was negatively associated with previously validated measures of intention to quit, self-efficacy, and abstinence-related motivational engagement, even after adjusting for nicotine dependence.
Conclusions: Findings provide initial validation for a new tool to assess cessation fatigue and contribute needed information on a theory-driven component of cessation-related motivation and relapse risk.

1. Introduction

Nearly two-thirds of smokers attempt to quit smoking annually (Lavinghouze et al., 2015), but the vast majority of quit attempts (QAs) end in relapse (Piasecki, 2006), even when assisted by the best available smoking cessation treatments (Cahill et al., 2014). Repeated QAs often precede long-term abstinence, indicating that most ex-smokers experienced repeated failures (Borland et al., 2012). A better understanding of processes that promote or impede renewed attempts to quit following a relapse could inform treatment development (Bold et al., 2014; Joseph et al., 2004), but few studies have addressed this important research question.

Cessation fatigue was first posited as a determinant of smoking relapse over 15 years ago (Piasecki et al., 2002). Greater cessation fatigue, or tiredness of attempting to quit smoking, was theorized to increase vulnerability to relapse, particularly late into a QA (i.e., once acute withdrawal symptoms had abated) when the cumulative cost of remaining abstinent depletes individuals' coping resources and capacity to remain quit. This latent construct was conceptualized as encompass-

ing loss of motivation to quit, loss of hope in cessation success, reduced coping skills utilization, decreased self-efficacy, and exhaustion of self-control resources. Although several subsequent papers have referred to cessation fatigue as a possible indicator of relapse susceptibility (Lagoa et al., 2014; Piper, 2015; Simmons et al., 2010), this construct remains poorly understood.

There is the potential for significant clinical impact of characterizing cessation fatigue, yet only one study has examined it empirically. Liu et al. (2013) assessed a single-item measure of cessation fatigue ("I am tired of trying to quit smoking,"), as a predictor of relapse among smokers within a randomized clinical trial (Liu et al., 2013). Higher cessation fatigue during the first 14 days of a QA was associated with reduced likelihood of abstinence at 6-month follow-up, and was associated with greater levels of craving and negative affect. Cessation fatigue was also shown to be responsive to intervention, with significant reductions among those who received active pharmacotherapies for smoking cessation vs. placebo. Though study findings are compelling, they are limited by reliance on a single item, which failed to take into account other cognitive and emotional factors that may comprise
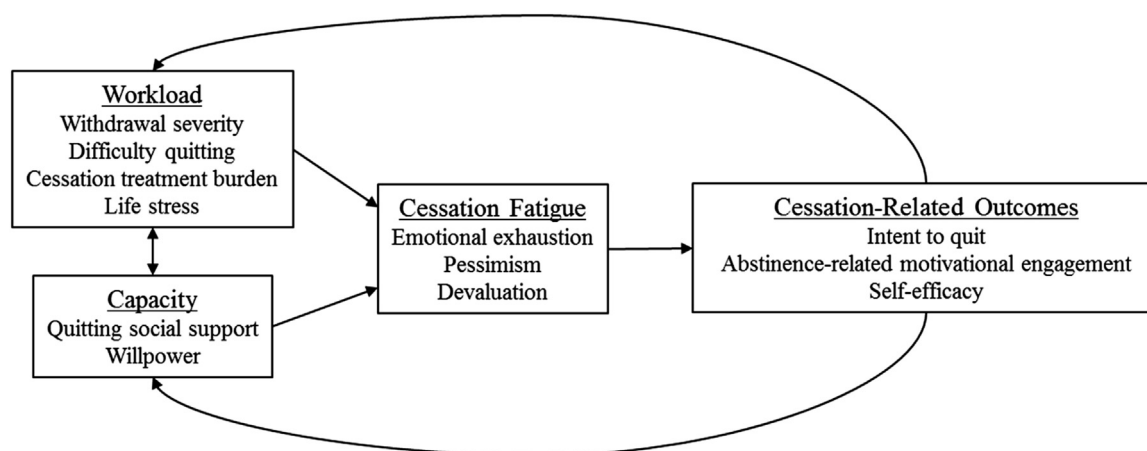
Fig. 1. Proposed Workload-Capacity Model of Cessation Fatigue.

cessation fatigue. Additionally, as cessation fatigue has been examined only among those actively undergoing a QA, its relationship with motivation to re-engage in a QA following relapse is not yet known.

Development of a comprehensive and theory-based assessment of cessation fatigue is needed in order to refine understanding of this construct in relation to cessation processes and outcomes. We previously described a workload-capacity model of treatment burden and fatigue to account for non-adherence to treatment recommendations often observed among patients with chronic health conditions (Heckman et al., 2015). In brief, this model sought to describe how demands associated with disease management, general life demands, and resources to cope with these demands interact to influence health behaviors. Herein, we propose an adapted version of this theoretical model specific to smoking cessation (see Fig. 1). Workload is comprised of demands associated with a) quitting (e.g., withdrawal severity, cessation treatment burden) and b) general life demands (e.g., stress). Capacity refers to coping resources (e.g., social support, willpower). Cessation fatigue should emerge as workload increases or capacity decreases. As conceptualized, cessation fatigue is relevant for smokers regardless as to whether QAs are unassisted or assisted (receiving cessation treatment), they are about to quit or have recently tried, and/ or their readiness to quit.

In the current study, we used a rational scale development approach to create the Cessation Fatigue Scale (CFS). In addition to examining the psychometric properties of the new measure, we examined its construct validity based on our proposed theoretical model. Specifically, we tested associations between cessation fatigue and measures of a) quit history, b) workload/capacity, and c) cessation-related outcomes. We hypothesized higher cessation fatigue would be associated with fewer lifetime QAs and shorter QA duration, greater smoking-specific (e.g., higher withdrawal severity) and general (e.g., life stress) workload factors, and reduced capacity (e.g., quitting social support, willpower). We also hypothesized cessation fatigue would be negatively associated with self-efficacy, intentions to re-engage in a QA, and current efforts towards abstinence.

2. Methods

2.1. Participants

Current smokers who had recently relapsed were recruited and surveyed online by Survey Sampling International (SSI). Eligible ($N = 484$) participants met the following criteria: (a) 18–65 years old, (b) current smoker, (c) have made an attempt to quit smoking for > 24 h that ended in relapse within the past 30 days (to minimize recall bias), and (d) smoked > 10 cigarettes per day prior to most recent QA. Relapse was defined as > 7 consecutive days of smoking

or > 1 day of smoking on 2 consecutive weeks (Hughes et al., 2003). Further, all eligible participants provided survey responses that minimized risk of rote responding, as indicated by length of administration between 10 and 120 min, consistent reporting of QA history, and correct response to periodic attention items (e.g., "Enter 4 here").

Participation was voluntary and anonymous. Following survey completion, a debriefing message was displayed and SSI provided compensation through various incentives (e.g., points to be used with online retailers, prizes or sweepstakes; cash; opportunity to donate to charity). All procedures were approved by the appropriate institutional review board.

2.2. Measures

2.2.1. Demographic and smoking history

In addition to standard sociodemographic characteristics, we assessed smoking history variables including age of onset, number and length of previous QAs, and utilization of smoking cessation treatment strategies. Nicotine dependence was assessed with the Heaviness of Smoking Index (HSI (Heatherton et al., 1989)). HSI scores were obtained for current smoking status and smoking status prior to most recent QA. Other measures are described below; all Cronbach's Coefficient Alpha values presented are from the current study.

2.2.2. Workload measures

General perception of withdrawal severity was assessed with 7 items from the Smoking Abstinence Questionnaire-Withdrawal subscale (SAQ (Hendricks et al., 2011); α = .92), a measure of smokers' expectancies for the abstinence process upon quitting smoking. Difficulty quitting was assessed with a single item: "How hard was it for you to quit smoking on your most recent quit attempt?" Responses options were 1 (*Easy*), 2 (*Slightly Difficult*), 3 (*Difficult*), or 4 (*Very Difficult*). Cessation treatment burden was assessed with a single item: "Think of a scale from 0 to 10, where 0 = no burden and 10 = considerable burden. During your most recent quit attempt, how would you rate the burden associated with the quit method(s) you used (e.g., time, money, functioning, social, well-being)?" Life stress was assessed with the 4-item Perceived Stress Scale (PSS (Cohen et al., 1983); α = .75).

2.2.3. Capacity measures

General perception of quitting social support was assessed with a single item from the SAQ-Social Support subscale (Hendricks et al., 2011): "The people close to me would do everything they could to help me quit." Responses were rated on a Likert scale from 0 (*Not likely at all*) to 6 (*Extremely likely*). Willpower was assessed with two items developed to index implicit theories of willpower in relation to self-reported effects of mental exertion, specifically: a) strenuous mental activity, and