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Short Communication

Financial strain and smoking cessation among men and women within a self-guided quit attempt

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HIGHLIGHTS

- Financial strain and smoking abstinence were examined among self-guided quitters.
- Financial strain predicted lower odds of CO-confirmed abstinence among men only.
- Financial strain may play a unique role in socioeconomic-based smoking disparities.
- Studies should explore if sex-specific models aid in understanding these relations.

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ABSTRACT

Introduction: Financial strain, defined as an unfavorable asset-to-needs ratio, has been associated with reduced odds of smoking cessation in the context of a structured clinical study providing cessation assistance. This study reports on a secondary data analysis that assessed the association of financial strain and biochemically-verified smoking abstinence within a structured clinical study of smokers making a self-guided cessation attempt.
Methods: Participants ($N = 58$; 65.5% men) were enrolled in a study about anxiety sensitivity and smoking cessation whereby they were instructed to initiate a self-guided quit attempt. Relations between financial strain and biochemically-verified smoking abstinence on the quit day and at Days 3, 7, 14, 28, and 90 post-quit were assessed using generalized estimating equations controlling for age, sex, race, education, partner status, pre-quit cigarettes smoked per day, and time.
Results: Associations between financial strain and abstinence in the whole sample were marginal (aOR = .94, 95% CI = .87–1.01, observations = 293; $p = .07$). However, sex was a significant moderator: greater financial strain was associated with lower odds of abstinence for men (aOR = .90, 95% CI = .80–1.00, observations = 201; $p = .05$), but not women (aOR = 1.05, 95% CI = .91–1.21, observations = 92; $p = .48$).
Conclusions: Results indicated that financial strain was associated with lower odds of cessation among men undergoing a self-guided quit attempt in the context of a structured clinical study. These data suggest that financial strain may be an important socioeconomic determinant of smoking cessation and support its relevance for better understanding socioeconomic-based smoking-related health disparities. Future work may benefit by exploring sex-specific models of financial strain in the context of smoking cessation.

1. Introduction

The prevalence of smoking in the U.S. is highest among individuals of lower socioeconomic status (SES; Agaku, King, & Dube, 2014). Financial strain, defined as an unfavorable asset-to-needs ratio, is a potentially overlapping construct with traditional indicators of low SES such as low income, low educational attainment, and unemployment (Szanton et al., 2008). However, financial strain represents not objective SES level, but rather income inadequacy relative to expenses and accumulated debt. In that way, financial strain is a construct that may be applicable to individuals of any SES strata who experience debt that exceeds their economic capacities and impacts their ability to afford food, clothing, housing, and other bills (Siahpush, Borland, & Scollo, 2003). Financial strain has been linked with both smoking prevalence and heaviness of smoking (Falba, Teng, Sindelar, & Gallo, 2005; Murayama et al., 2013; Nelson, Lust, Story, & Ehlinger, 2008). Moreover, studies indicate that the likelihood of experiencing financial stress

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was greater among households containing smokers relative to non-smokers, regardless of income (Siahpush et al., 2003) and that the odds of current smoking increase as financial strain increases (Shaw, Agahi, & Krause, 2011). Although financial strain has received less attention relative to the more traditional SES indicators, these and other studies support that financial strain represents a distinct construct and suggest that it may be an important social determinant of smoking behaviors in its own right. This is especially critical to investigate given that financial strain seems to be rising in the U.S. (Garcia & Draut, 2009; Rapoport & Wheary, 2013; Weller, 2012).

Individuals experiencing financial strain are more likely than their counterparts to report interest in quitting smoking (Siahpush, Yong, Borland, Reid, & Hammond, 2009). Notably, quitting smoking significantly reduces the likelihood of experiencing future financial stress (Siahpush, Spittal, & Singh, 2007a, 2007b). However, financial strain appears to hinder cessation. For example, financial strain was associated with lower quit rates and a greater likelihood of relapse among recent quitters one year later in an Australian cohort study (Siahpush & Carlin, 2006). A multi-country study indicated that financial strain was associated with lower odds of self-reported abstinence among individuals who tried to quit smoking (Siahpush et al., 2009). Similar results have been found within a structured clinical study where participants were provided with counseling and other cessation aids, even after accounting for the effects of SES (Kendzor et al., 2010). Thus, a growing literature appears to support the potential influence of financial strain on smoking relapse. Moreover, the consistency of results found between population-based studies of self-guided quitters and a clinical study of aided quitters suggests the robustness of these associations and their potential generalizability to diverse groups of intended-quitters. Better understanding the association between financial strain and cessation within self-guided quit attempts remains of interest because some quit attempts are undertaken without aid (Chapman & MacKenzie, 2010; Zhu, Melcer, Sun, Rosbrook, & Pierce, 2000), and no previous studies of self-guided quitters, to our knowledge, have benefitted from biochemical confirmation of abstinence status.

This study examined the association between financial strain and smoking abstinence during a self-guided quit attempt and extends the extant literature by examining these relations within the context of a structured clinical study utilizing biochemical-verification of abstinence status. In addition, sex was explored as a potential moderator of these relations given that women are more likely than men to experience financial strain [Wider Opportunities for Women (WOW), 2011], and the effects of financial strain on health and health outcomes may differ by sex [e.g., (Cambois & Jusot, 2011)].

2. Material and methods

2.1. Participants and procedures

This study was a secondary data analysis of a parent study focused on anxiety vulnerability and smoking cessation ($N = 64$). All procedures were approved by the Institutional Review Boards at the Universities of Vermont and Houston. Participants were recruited via advertisements for a research study on "quitting smoking" and were initially screened via phone. Included participants were 18–65 years of age; a daily smoker for ≥1 years of ≥5 cigarettes per day (CPD); and interested in making a serious but unaided quit attempt. Exclusion criteria entailed evidence of limited mental competency (not oriented to person, place, or time); pregnancy; current nicotine replacement therapy use; current or past history of psychotic-spectrum symptoms/disorders; suicidality; and the "as needed" use of psychotropic medication. The Structured Clinical Interview for *DSM-IV-TR* Axis I Disorders, Non-Patient Version (First, Spitzer, Gibbon, & Williams, 2002) and a modified version of the Medical History Form (Scheftner & Endicott, 1984) were used to assess the latter exclusionary criteria.

Eligible participants were scheduled for an in-person baseline visit, which included a final assessment of eligibility criteria, completion of written informed consent, verification of smoking status via expired breath carbon monoxide (CO) ≥8 ppm, and the completion of a structured clinical interview and study questionnaires. Participants were instructed to initiate a self-guided smoking quit attempt 14 days following the baseline session. Participants then attended in-person visits on their quit day, 3 days post-quit (Day 3), 7 days post-quit (Day 7), 14 days post-quit (Day 14), 28 days post-quit (Day 28), and 90 days post-quit (Day 90). Participants could be compensated up to $100, based on procedural compliance.

2.2. Measures

2.2.1. Sociodemographic characteristics

Sociodemographic characteristics collected at baseline included age, sex, race (non-Hispanic White versus other race), education (high school degree/equivalent or less, Associate's degree or some college, versus Bachelor's degree or greater), and partner status (married or living with partner versus not married).

2.2.2. Smoking-related variables

Smoking-related variables collected at baseline included the number of CPD and the time to the first cigarette of the day (</= 30 min versus >/= 31 min after waking).

2.2.3. Financial strain

The Financial Strain Questionnaire was collected at baseline and consisted of 7 items adapted from an economic strain measure to assess the degree to which it was financially difficult for participants to afford food, clothing, housing, major items (e.g., car), furniture/household equipment, leisure activities, and bills at the present time (Pearlin, Lieberman, Menaghan, & Mullan, 1981). Response categories were: 1 = no difficulty, 2 = some difficulty, and 3 = great difficulty. Total scores could range from 7 to 21, with higher scores indicative of greater financial strain. Cronbach's alpha in this sample was .84.

2.2.4. Smoking abstinence

Smoking abstinence was indicated by a self-report of no smoking since the previous in person assessment (not even a puff) and

Table 1
Participant characteristics ($N = 58$).

Participant characteristics	Mean [SD]/*n* (%)
Age	34.91 [14.28]
Cigarettes per day	15.33 [5.52]
Sex	
Male	38 (65.5)
Female	20 (34.5)
Race/ethnicity	
Non-Hispanic White	50 (86.2)
Other race	8 (13.8)
Education	
High school or less	8 (13.8)
Associate's degree/some college	35 (60.3)
Bachelor's degree or greater	15 (25.9)
Partner status	
Married or living with someone	17 (29.3)
Not married or living with someone	41 (70.7)
Recruitment site	
University of Vermont	50 (86.2)
University of Houston	8 (13.8)
Current SCID-NP diagnosis	
No current SCID-NP diagnosis	35 (60.3)
Current SCID-NP diagnosis	23 (39.7)
Time to first cigarette of the day	
31 or more minutes after waking	17 (29.3)
Within 30 min of waking	41 (70.7)
Financial strain	14.28 [3.78]

Note: SCID-NP = Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Non-Patient Version.