Associations between smoking behaviors and financial stress among low-income smokers

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ABSTRACT
Objective. Many American households struggle to bring in sufficient income to meet basic needs related to nutrition, housing, and healthcare. Nicotine addiction and consequent expenditures on cigarettes may impose extra financial strain on low-income households. We examine how cigarette use behaviors relate to self-reported financial stress/strain among low-income smokers. Methods. At baseline in 2011/12, OPT-IN recruited adult smokers age 18–64 from the administrative databases of the state-subsidized Minnesota Health Care Programs (N = 2406). We tested whether nicotine dependency, type of cigarettes used, and smoking intensity were associated with financial stress/strain among low-income smokers. Results. Difficulty living on one’s income (77.4%), paying for healthcare (33.6%), paying for housing (38.4%), and paying for food (40.8%) were common conditions in this population. Time to first cigarette and cigarettes smoked per day predicted financial stress related to affording food, housing, and living within one’s income (all p < 0.05). For instance, those whose time to first cigarette was greater than 60 minutes had about half the odds of reporting difficulty paying for housing compared to those who had their first cigarette within five minutes of waking (adjusted odds ratio = 0.55 [95% CI: 0.41, 0.73]). Type of cigarette used was not associated with any type of financial stress/strain. Conclusions. Smoking and particularly heavy smoking may contribute in an important way to the struggles that low-income households face in paying for necessities.

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Introduction

The burden of smoking’s harms tend to disproportionately threaten those in society with fewer resources and advantages (U.S. Department of Health and Human Services, 2014). In 2013, the prevalence of smoking among US adults living at or below the US Census poverty threshold was 80% greater than that of those living above the poverty line (33.8% compared to 18.7%) (Jamal et al., 2014). This elevated prevalence is in part due to the reality that compared to more advantaged smokers, over time disadvantaged smokers have a lesser likelihood of quitting (Kotz and West, 2009; Kendzor et al., 2010). Given this, low-income smokers are a priority population for whom tobacco cessation efforts require further development, adaptation, and innovation.

In addition to dramatic adverse health effects, cigarette use is also an expensive behavior that may have a broader impact on the wellbeing of smokers with limited financial resources. In December 2014, the average price per pack of cigarettes in the US was $6.18 (Boonn, 2014), which means that a household consuming a pack of cigarettes per day would be paying just over $2,250 per year for cigarettes – or approximately 10% of the annual income for a two-adult, two-child household living at the US Census poverty threshold (DIS US Census Bureau, n.d.). In many low-income households the portion of a household’s budget devoted to purchasing cigarettes is even greater. For instance, Farrelly and colleague estimated that in New York state, a market where cigarette prices are relatively high, low-income households (< $30,000 per year) with smokers spend approximately 24% of their annual household income on cigarettes (Farrelly et al., 2012). As such, a low-income household that includes even one smoker could see a substantial proportion of its disposable income consumed by cigarette purchases.

Low-income households often struggle to access necessities such as food, housing, and healthcare; if resources are being diverted from these
needs to purchase cigarettes, these households will likely experience even more intensified financial strain as tobacco spending supplants other expenditures (Busch et al., 2004). Due to a variety of structural factors, financial strain for low-income household is typically not transient and can be a long-term stressor. Indeed, both individuals and households that spend more on tobacco are more likely to report financial strain and stress (Siahpush et al., 2003, 2012; Pyle et al., 2007). Households with smokers have been shown to accumulate less wealth over time. An analysis that examined four waves of the National Longitudinal Survey of Youth 1979 Youth Cohort revealed that each year an adult spent as a smoker resulted in a 4% wealth reduction compared to non-smokers in the sample (Zagorsky, 2004). There is cross-sectional evidence that tobacco use is associated with food insecurity or difficulties in accessing adequate food (Cutler-Triggs et al., 2008; Armour et al., 2008; McIntyre et al., 2000; Widome et al., 2014; Bocquier et al., 2015; Tolzman et al., 2014; Iglesias-Rios et al., 2013; Hood et al., 2013). Further, smoking households spend less on housing than non-smoking households (Busch et al., 2004) and households with smokers are more likely to have insufficient emergency funds (Grafova, 2011). Quitting smoking has been shown to reduce financial stress (Siahpush et al., 2007a,b). Of note, the purchase price of cigarettes is not the only excess costs that smokers, compared to non-smokers, incur throughout their lives. Smoking is also related to financial strain through smoking-caused diseases (Brook and Zhang, 2013) which often have very high healthcare costs and can curtail the sufferer’s income-earning years (Yelin et al., 2006; Tinkelman et al., 2005). The result of households not accessing adequate necessities could include poorer diet, delayed treatment for health issues, and other negative consequences that have additional important health implications beyond the direct harm that cigarette smoking does to active and passive smokers.

The causal relationships between financial strain and smoking are likely not entirely unidirectional. Smoking can be used by smokers as a way to cope with life’s stressors. Some have viewed financial strain as a stressor and risk factor for smoking (Advani et al., 2014). Evidence for this includes an observational examination of increases in financial strain over time which corresponded with greater odds of smoking in some populations (Shaw et al., 2011). Additionally there is evidence that smokers experiencing financial strain have more difficulty quitting, likely due to increased day-to-day stress (Kendzor et al., 2010; Siahpush and Carlin, 2006). Furthermore, the onset of financial strain increases the probability that a former smoker will relapse (Grafova, 2011).

Use of menthol products also may relate to financial strain. Menthol cigarettes have been traditionally and successfully marketed at disadvantaged populations including low-income neighborhoods (Laws et al., 2002; Seidenberg et al., 2010; Widome et al., 2013) and are much more commonly used by Blacks and lower-income individuals (Caraballo and Asman, 2011). Given this demographic pattern of menthol use it is possible that those who use menthol cigarettes are among those who experience the most financial stress.

The objective of this analysis was to describe how various smoking behaviors were related to different types of financial stress in a low-income population. The cross-sectional analysis used baseline data from a smoking cessation trial in low-income smokers covered by government insurance. We hypothesized that more frequent smoking, greater cigarette consumption, greater nicotine dependency, and being a menthol smoker would all be associated with 1) greater financial strain, 2) greater financial stress in the domains of housing and food, and 3) similar financial stress around healthcare, a stressor which we postulated would be uncommon due to this population’s participation in government insurance. Specifically we aimed to add to the existing literature on smoking and financial stress/strain by simultaneously examining different realms of stress/strain and testing whether menthol users were at greater risk. Our sample, composed exclusively of low-income smokers was uniquely suited to this question. Our goal was to replicate previous findings with more fine-grained detail.

Methods

Design

OPT-IN is a randomized controlled trial investigating whether proactive tobacco cessation outreach can increase tobacco abstinence and tobacco treatment utilization among low-income smokers (Fu et al., 2014). The study recruited English-proficient adult (age 18–64) smokers (smoked in past 30 days) enrolled in the Minnesota Health Care Programs (MHCP), a set of state-subsidized insurance program for low-income Minnesotans. (Income and asset eligibility guidelines for the MHCP can be found here: https://edocs.dhs.state.mn.us/lfserver/Public/DHS-3461A-ENG) OPT-IN baseline survey data, which was used for this present analysis, was collected prior to randomization using a modified-Dillman (Dillman, 2000) procedure to maximize response. Potential participants were first mailed an invitation and introduction letter. A second letter contained consent materials, questionnaire, a $2 cash incentive, and business-reply envelope. A reminder/thank you letter was mailed one week later. Two weeks after the initial survey mailing, a second survey was mailed to non-responders. Among the 21,181 individuals initially mailed surveys, 9,362 returned a survey and from these 6,826 did not meet OPT-IN inclusion criteria and 130 expressed they did not want to participate. This resulted in 2,406 individuals who were randomized and which were included in this present analysis. All procedures were approved by the University of Minnesota institutional review board prior to the start of the study.

Measures

Three OPT-IN baseline survey items addressed financial stress in specific areas: Participants were asked to report how often in the past 12 months they were worried or stressed about having enough money to: 1) “...get the health care you or your family needed;” 2) “...pay your rent or mortgage;” and 3) “...buy healthy food.” For these three items participants selected from the following options, which we then grouped into the following two levels, 1) “Frequently experiencing strain” which included those who responded with “almost always,” or “usually,” or 2) “Infrequently experiencing strain” which included those who responded, “sometimes,” “rarely,” or “never.” There was a fourth item on overall financial strain, “How difficult is it for you to live on your total household income right now?” These response options were dichotomized into 1) “Difficult” which included, “very difficult,” and “difficult,” and 2) “Not difficult,” which included the options, “not difficult,” “easy,” “very easy.”

Smoking behavior survey measures included frequency and type of cigarette use as well as level of nicotine dependence. Participants were asked if they usually smoked menthol, non-menthol, or both types of cigarettes. They were also asked to report the number of the past 30 days on which they smoked cigarettes, how many cigarettes they smoked per day on average and how soon after waking up they typically smoked their first cigarette. The potential confounders of race/ethnicity, gender, age, education level and income were also assessed on the OPT-IN questionnaire.

Analysis

We summarized demographics, smoking behavior measures, and proportion of participants who reported financial strain in each category. We used logistic regression to model the associations between smoking behaviors and financial strain adjusted for the demographic and socio-economic status measures discussed above. We calculated adjusted odds ratio and 95% confidence intervals (95% CI) for the predictor-outcome relationships of interest from these models. All analyses were performed with SAS 9.2 (SAS Institute Inc., Cary, NC).

Results

Difficulty living on one’s income (77.4%), paying for healthcare (33.6%), paying for housing (38.4%), and paying for food (40.8%) were
commonly reported in this population. Table 1 shows unadjusted bivariable associations where those at lower incomes were more likely to report these issues (all p < 0.01). Those who had more frequent concern about living on their income tended to be older (p = 0.006). Women and non-whites were more often concerned about paying for food. Blacks reported more concern about paying for healthcare (p = 0.027).

Nicotine dependence (measured by time to first cigarette and the number of cigarettes smoked per day) was associated with concerns about paying for housing and paying for food (Table 2). For instance the odds of reporting frequent concern about paying for housing and food were 22.1% and 19.0% greater respectively per 10 additional cigarettes per day. While the number of day sin the past 30 days that a participant smoked did not predict financial stress in any of the three specific areas, it was significantly associated with the overall measure of financial strain that asked participants to report difficulty in living on total household income. No predictor behaviors showed significant association with affording healthcare and cigarette type was not associated with any specific measure of financial stress or overall financial strain.

In the multivariable models reported in Table 2, income and employment were consistently significantly associated with reporting financial strain, income was consistently associated with stress about paying for housing and income and gender were both consistently associated with stress about paying for food (no covariates were associated with stress about paying for healthcare).

### Discussion

We found that those smokers who reported greater nicotine dependence and those who reported smoking more cigarettes per day were more likely to report both difficulty living within their household’s income restraints and greater concern about affording food and housing. Contrary to our hypothesis, cigarette type (menthol vs. non-menthol) was not associated with any measure of financial stress.

We expected that menthol smokers might experience more economic struggles than non-menthol smokers. We had postulated that even in this low-income sample, menthol smokers may have even fewer resources, due to the tobacco industry’s practice of targeting menthol product marketing in low-income neighborhoods (Laws et al., 2002; Seidenberg et al., 2010; Widome et al., 2013). Perhaps we might have observed that menthol smokers experienced more financial stress in a sample where income levels varied more. But given that all of the participants in this study qualified for subsidized health insurance, there may have been a relatively even reception of types of tobacco marketing across the income levels, although this was not measured.

None of the cigarette consumption behaviors were associated with concern about affording healthcare. This contrasts with other findings of struggling in other domains. Interestingly, paying for healthcare actually was endorsed by about a third of the sample as a source of stress in this sample even though the entire sample was drawn from MHCP and was thus insured. We had assumed that stress around paying for

### Table 1

Demographics of OPT-IN sample by financial concern category, unadjusted. OPT-IN 2011/12; n = 2406.

| Education | HOUSEHOLD INCOME | CONCERN ABOUT AFFORDING HEALTHCARE | CONCERN ABOUT PAYING FOR HOUSING | CONCERN ABOUT PAYING FOR FOOD |
|-----------|------------------|------------------------------------|----------------------------------|-------------------------------|
|           | Frequently | Infrequently | Frequently | Infrequently | Frequently | Infrequently | Frequently | Infrequently | p     |
| Income    |           |            | p          |            | p          |            | p          |            |
| <$10,000  | 256  14%  | 62  12%   | 0.063      | 111  14%  | 206  13%  | 0.905      | 131  15%  | 186  13%  | 0.471  |
| $10,001-20,000 | 584  32%  | 182  35%   |            | 321  32%  | 154  33%  |            | 291  32%  | 483  34%  | 0.287  |
| $20,001-40,000 | 769  43%  | 200  38%   |            | 324  42%  | 646  42%  |            | 379  42%  | 591  41%  | 0.429  |
| <$40,000  | 1799  52%  | 525   |            | 770  31%  | 75%  5%  |            | 47  5%  | 63%  4%  | 0.485  |
| Employment | Yes      | No       |            |            | p          |            | p          |            |
| Employed | 35%  40.4 | 59.6  | 0.001      | 351  44.9 | 671  43.4 | 0.496      | 386  43.0 | 642  44.5 | 0.490  |
| Unemployed | 65%  294 | 255  |            | 219  28%  | 461  30%  |            | 241  27%  | 461  30%  | 0.008  |
| Sex       | Male     | Female   |            |            |            |            |            |            |
| Male      | 507  28%  | 177  34%   | 0.009      | 219  28%  | 461  30%  |            | 241  27%  | 461  30%  | 0.009  |
| Female    | 1207  72% | 343  66%   |            | 657  72%  | 998  69%  |            | 722  72%  | 927  67%  | 0.001  |

Note: Category totals less than 2,406 due to missing values.
would not be a direct consequence of consuming a greater number of cigarettes. Instead, stress about paying for healthcare may not impact ability to pay these expenses. Instead, stress about paying for healthcare may not be higher in households that have greater expenditures on cigarettes. One explanation may be that households have very few resources to pay for healthcare in this particular population. Interestingly, we did not find that increase the reach of effective tobacco cessation programs, could potentially further widen chronic disease disparities.

Conflict of interest statement

The authors declare there is no conflict of interest.
