Predictors of Counseling Participation Among Low-Income People Offered an Integrated Intervention Targeting Financial Distress and Tobacco Use

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Abstract

Introduction Although prevalence of smoking in the USA has been decreasing for decades, smoking rates among low-income individuals remain elevated. Theories from behavioral economics and prior research suggest that financial stress may contribute to the difficulty that low-income smokers face in quitting. The present work is a secondary analysis of a randomized controlled trial that incorporated financial coaching and social services referrals into smoking cessation treatment. Primary analyses showed that participants randomized to the intervention ($N = 208$) were significantly more likely not to smoke, to have lower financial stress, and to be able to afford leisure activities ($p < .05$) than were control participants ($N = 202$).

Methods This paper investigates subgroup discrepancies in attendance of intervention sessions and in uptake of various components of this intervention through exploratory analysis.

Results Analysis using logistic regression indicated that decreased age, not having received higher education, and having income less than \$1000 per month were predictive of decreased counseling attendance ($p < .05$). Few demographic factors were predictive of uptake of counseling components among those who attended counseling.

Conclusions These results can guide future efforts to increase participant engagement in the intervention.

Trial Registration ClinicalTrials.gov Identifier: NCT03187730.

Introduction

The US Surgeon General first identified smoking as a public health hazard nearly 60 years ago (Brawley et al., 2014). Since that announcement, prevalence of smoking has decreased by nearly 30% (Gallup, 2018). But smoking rates of low-income individuals remain elevated (Bock et al., 2014). Today, among people 18 years and older, those living below the poverty line are twice as likely to smoke as those living at or above 200% of the poverty line (CDCTobaccoFree, 2019). Some of the income-related tobacco use disparity may be due to differential access to treatment (Koma et al., 2017; Lazar & Davenport, 2018). However, although several interventions have proven effective in the short-term, even clinically efficacious interventions tend to fail to successfully foster long-term abstinence among low-income people who smoke (Bull et al., 2014).

Having low income is an indicator of a more complex issue: poor financial health. Financial health is a key social determinant of health defined as one's ability to manage expenses, afford needs, minimize and recover from financial shocks, minimize debt, and build wealth (Weida et al., 2020). Poor financial health is consistently associated with poor physical health and well-being in the USA and is one of the greatest sources of chronic stress among adults in the USA (Bethune, 2015). In people with low incomes, stress in general (Cambron et al., 2019), and financial stress in particular (Kendzor et al., 2010) are significant barriers to achieving long-term smoking cessation. Moreover, behavioral economics research suggests that economic deprivation induces people to focus on their immediate needs for survival, leaving them depleted of the emotional and cognitive resources needed to resist immediate gratification and prioritize delayed goals, such as quitting smoking (Mullainathan & Shafir, 2013; Vohs & Faber, 2007). Clinical and public health interventions related to financial hardship often focus on a single issue, such as food insecurity or access to care,

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rather than targeting individuals' overall financial health. Financial incentive interventions that provide temporary monetary rewards for quitting are increasingly studied in the field of smoking cessation and are effective at increasing short-term abstinence rates (Halpern et al., 2015; Kendzor et al., 2015; Mantzari et al., 2015; Volpp et al., 2009). However, small monetary rewards for quitting do not remediate financial hardship as a structural determinant of long-term smoking and risk for relapse.

A recent randomized controlled trial (RCT; Rogers et al., 2022) demonstrated that a smoking cessation intervention that incorporated money management coaching, screening for financial benefits, and referral to community-based financial empowerment services resulted in significantly increased smoking abstinence, and decreased financial distress, compared to a minimal usual care control. However, intervention uptake overall was modest, with only 55% of participants randomized to the Intervention attending at least one intervention session within the 6-month intervention period. Among people who began the intervention, 85% received money management coaching, 47% completed the financial benefits screening, and 37% scheduled an appointment with a financial empowerment center. Previous studies of financial coaching have reported program uptake around 50% (Moulton et al., 2013; Theodos et al., 2015), and the only other smoking cessation RCT to include referral to community-based social services reported that only 47%
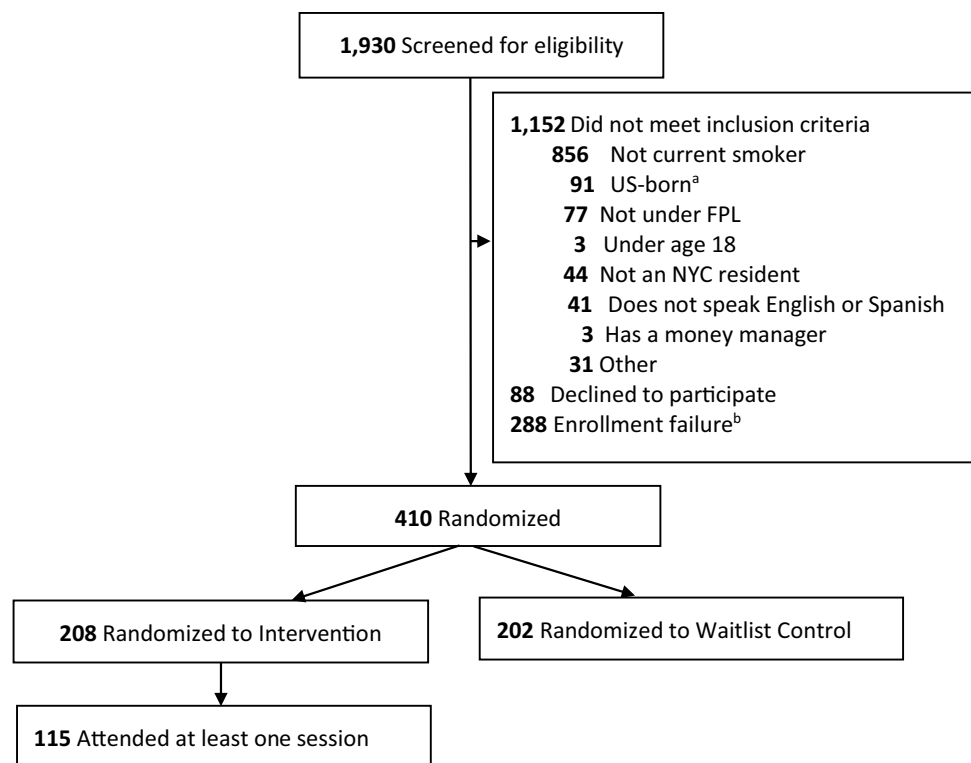
of participants accepted the social services referral (Haas et al., 2015). To help inform future efforts devoted toward increasing low-income patient engagement in financial coaching and benefits referrals, the present study is a secondary analysis of the RCT by Rogers et al. (2022) that investigates participant factors associated with intervention engagement.

Methods

Settings and Participants

The parent trial enrolled 414 adults residing in New York City, recruited from 2017 to 2019, with household income below 200% of the federal poverty line, who had smoked at least one cigarette within the past 30 days, who were able to participate in the study in either English or Spanish, who were not pregnant or breastfeeding, and who did not have a conservator managing their money. The current analysis focused on 208 participants randomized to the Intervention Fig. 1. Participants in the waitlist control condition were excluded because rates of dropout and loss to follow-up were so different in this group that we concluded investigating factors of non-completion among the two groups together would be likely to obscure the findings.

Fig. 1 Flowchart of participant enrollment and follow-up. *Abbreviations*: FPL federal poverty level, NYC New York City. [a]During the first 4 months of recruitment, people had to be born outside of the USA to be eligible. Enrollment to US-born smokers was opened in January 2018. [b]An enrollment failure represents either a person who (1) was eligible but did not attend their consent appointment or (2) who was determined to not be a current smoker after enrollment

Flowchart:

1,930 Screened for eligibility

1,152 Did not meet inclusion criteria
- **856** Not current smoker
- **91** US-born[a]
- **77** Not under FPL
- **3** Under age 18
- **44** Not an NYC resident
- **41** Does not speak English or Spanish
- **3** Has a money manager
- **31** Other
- **88** Declined to participate
- **288** Enrollment failure[b]

410 Randomized

208 Randomized to Intervention

202 Randomized to Waitlist Control

115 Attended at least one session

Recruitment and Randomization

Research assistants administered a baseline survey in-person after enrollment, but before randomization. The survey collected sociodemographic information (age, race, ethnicity, sex, health insurance, annual household income, housing status), information about current smoking (PATH, 2013), nicotine dependence (Heatherton et al., 1991), smoking-induced deprivation (Siahpush et al., 2007), financial distress (Prawitz et al., 2006), functional health literacy (Chew et al., 2004, 2008), health-related quality of life (HRQL; Rabin & Charro, 2001), psychological distress (Kessler et al., 2002) food security (Blumberg et al., 1999), banking status, and current receipt of financial benefits (food, housing, utilities). Following baseline completion, participants were randomized to the Intervention group or Control group.

Intervention

The Intervention offered up to nine sessions of individual counseling. The first two sessions occurred in offices at participating sites. The remaining sessions were on-site or over the phone, depending on participant preference and needs.

All Intervention participants received a base program that included evidence-based smoking cessation coaching to help them develop an individualized quit plan (Fiore et al., 2008; Rogers et al., 2016). The coaching used problem-solving therapy to enhance motivation and efficacy, learn from prior quit attempts, identify and cope with triggers, and address environmental barriers. Participants were also offered a free 4-week supply of nicotine replacement therapy (NRT). The intervention integrated two financial coaching components into the cessation coaching sessions:

Screening and referral for financial benefits and empowerment programs. Counselors offered to screen participants for benefits using the "NYC Access" website—a centralized resource for identifying city, state, and federal programs in multiple domains, including housing, education, childcare, health care, and legal aid. The counselors also offered to schedule participants an appointment with a NYC Financial Empowerment Center (FEC) to receive counseling to help with major financial issues. FEC counseling is free and confidential, regardless of income or immigration status.

Money management coaching. Interventionists offered participants money management coaching following a protocol adapted from a money management–based substance use intervention (Black & Rosen, 2011). The coaching followed best-practices in financial coaching by working with participants longitudinally to develop and work toward client-centered goals. The coaching had two primary objectives: (1)

to help participants create and maintain a household budget to meet short- and long-term goals and (2) to highlight and reinforce the link between tobacco cessation and the participant's goals through the release of discretionary income spent on tobacco. The counselors helped participants create an ideal monthly budget and identify three goals that they would work on during the coaching. Tobacco spending and savings were discussed during each session to reinforce the link between quitting smoking and achieving one's goals.

Waitlisted Control

Participants randomized to the control group received the intervention after a 6-month waiting period. During the waiting period, control group participants could receive usual care smoking cessation services from their providers or from the community.

Variables of Interest

Outcomes

The current analysis focused on four binary treatment engagement outcomes among participants in the Intervention group. One outcome variable was odds, among all Intervention participants, of attending at least one counseling session. The additional three outcome variables were calculated only for those participants who attended at least one counseling session: odds of being referred to the financial empowerment center (FEC), receiving money management coaching, and/or completing the screening and referral to social services via the NYC Access website.

Predictor Factors

Factor variables were organized according to Andersen's Behavioral Model of Health Services Use into three categories: predisposing, enabling, and need (Babitsch et al., 2012). The predisposing factors were race and ethnicity, age, biological sex, language preference, place of birth, highest level of education, employment status, housing status, receipt of food assistance, receipt of housing assistance, receipt of bills assistance, possession of a bank account, possession of an ATM card, willingness to quit smoking, confidence in ability to quit, and past quit attempts. The enabling factors were HRQL (Rabin & Charro, 2001), psychological distress (Kessler et al., 2002), food security (Blumberg et al., 1999), housing status, insurance status, and the following health literacy factors: difficulty filling out medical forms, understanding medical condition, and reading hospital materials. The need factors were financial distress (Prawitz et al., 2006), economic deprivation due to the financial impact of

smoking (Siahpush et al., 2007), and income. See Table 1 for univariate analyses of these factors.

Analytic Methods

All analyses were performed using R. After data cleaning and univariate exploration, bivariate analyses were undertaken to identify significant associations between outcomes and potential factors. For each outcome, the factors whose levels differed significantly ($p < 0.1$) in a chi-squared test were included in a multiple logistic regression. For the model predicting counseling attendance, the 208 participants randomized to the intervention condition were eligible to be included. The analytic sample ultimately included the 177 participants with complete data for the variables in the model. For the models predicting uptake of intervention components among participants who attended at least one counseling session, 115 participants were eligible to be included. Analytic samples for these analyses ranged from 103 to 113. Backward elimination was performed for each regression to make the model more parsimonious. Variables were removed, one-by-one, until the model with optimal Akaike Information Criterion (AIC) was identified. Table 2 summarizes these parsimonious models.

Results

Participants

Table 1 outlines participant baseline characteristics. Most Intervention group participants were male (66.8%), unemployed (70.8%), had a high school education or less (58.2%), and had made a quit attempt in the prior year (51.0%). The most common self-identified race and ethnicity in the sample were non-Latinx Black (41.1%) and Latinx of any race (37.7%), and the most common type of health insurance was Medicaid (42.4%). A little over one-third (34.1%) of the sample were immigrants, 31.7% were housing insecure, 55.8% had either low or moderate food security, 48.6% did not have a bank account, 37.3% had a household income of less than $1000 per month, 40.0% reported high financial distress, and 47.0% had recent smoking-induced deprivation.

Attendance of At Least One Session of Counseling

In bivariate analyses, participants significantly differed in odds of attending at least one counseling session among levels of the following variables: age, education level, possession of a bank account, possession of an ATM card, difficulty with reading health-related forms, level of food security, and income level. Therefore, we fit a multiple regression model with these variables as predictors of the log odds of

attending counseling. Following backward elimination, the most parsimonious model included only age, immigration status, and income as independent variables, each of which were significantly predictive the outcome ($p < 0.05$). In terms of attending at least one counseling session, participants age 61 or older had 4.2 times greater odds than did those younger than 48 [95% confidence interval (CI) 1.52–11.20], those with at least some post-secondary education had 2.7 times greater odds than did those without a high school diploma or equivalent (95% CI 1.13–6.55), and those with income greater than $1000 per month had 2.7 times greater odds than did those with income below $1000 per month (95% CI 1.34–5.46).

Receipt of Money Management Coaching

Participants significantly differed in odds of accepting the offer to receive money management coaching among levels of the following variables: economic deprivation resulting from buying cigarettes and level of financial distress. The model including both variables was most parsimonious. In this regression, only financial distress significantly contributed to the model ($p < 0.05$). In terms of receiving money management coaching, participants with high financial distress had 6.9 times greater odds of engaging in money management coaching than did those with low financial distress (95% CI 1.16–41.13).

Receipt of Referral to the Financial Empowerment Center

Participants who preferred speaking Spanish differed in odds of accepting referral to the FEC compared with those who preferred speaking English in a chi-squared test ($p = 0.09$). However, language preference did not significantly predict referral to the FEC in a multivariable model (OR = 0.32, $p = 0.057$, 95% CI 0.10–1.04).

Receipt of Screening and Referral to Social Services with NYC ACCESS

Participants significantly differed in odds of accepting screening and referral to social services with the NYC ACCESS website among levels of age and EQ-5D. In a multiple regression with these variables, only age was significantly predictive of the outcome ($p < 0.05$), and the most parsimonious model contained only age as a predictor. In terms of receiving screening and referral to social services, people aged 55–60 had 4.1 times greater odds than did those under 48 (95% CI 1.23–13.77).

Table 1 Predisposing, enabling, and need characteristics of participants at baseline

Category	Baseline characteristic	Total		Counseling attendees	
		N = 208	Missing	N = 115	Missing
Predisposing	Race/Ethnicity		1		1
	Non-lx White	33 (15.9%)		21 (18.4%)	
	Latinx	78 (37.7%)		43 (37.7%)	
	Non-lx other	11 (5.31%)		6 (5.26%)	
	Non-lx Black	85 (41.1%)		44 (38.6%)	
	Age		0		0
	Under 47	48 (23.1%)		23 (20.0%)	
	48–54	51 (24.5%)		23 (20.0%)	
	55–60	59 (28.4%)		30 (26.1%)	
	61 +	50 (24.0%)		39 (33.9%)	
	Language preference		2		2
	English	170 (82.5%)		91 (80.5%)	
	Spanish	36 (17.5%)		22 (19.5%)	
	Immigrated		0		0
	No	137 (65.9%)		73 (63.5%)	
	Yes	71 (34.1%)		42 (36.5%)	
	Educated		0		0
	No HS diploma	48 (23.1%)		22 (19.1%)	
	HS/GED	73 (35.1%)		35 (30.4%)	
	Some higher Ed +	87 (41.8%)		58 (50.4%)	
	Employed		22		9
	No	138 (70.8%)		75 (70.8%)	
	Yes	57 (29.2%)		31 (29.2%)	
	Biological sex		0		0
	Male	139 (66.8%)		75 (65.2%)	
	Female	69 (33.2%)		40 (34.8%)	
	Food assistance		0		0
	No	71 (34.1%)		42 (36.5%)	
	Yes	137 (65.9%)		73 (63.5%)	
	Housing assistance		0		0
	No	118 (56.7%)		69 (60.0%)	
	Yes	90 (43.3%)		46 (40.0%)	
	Bills assistance		0		0
	No	156 (75.0%)		90 (78.3%)	
	Yes	52 (25.0%)		25 (21.7%)	
	Bank account		1		0
	Unbanked	101 (48.6%)		47 (40.9%)	
	Banked	107 (51.4%)		68 (59.1%)	
	ATM card		27		16
	No	33 (18.2%)		11 (11.1%)	
	Yes	148 (81.8%)		88 (88.9%)	
	Quit attempt		0		0
	No	102 (49.0%)		58 (50.4%)	
	Yes	106 (51.0%)		57 (49.6%)	
	Quit Motivation		2		1
	Unmotivated/ambivalent	53 (25.7%)		28 (24.6%)	
	Somewhat motivated	84 (40.8%)		47 (41.2%)	
	Fully motivated	69 (33.5%)		39 (34.2%)	
	Quit confidence		1		0

Table 1 (continued)

Category	Baseline characteristic	Total		Counseling attendees	
		N = 208	Missing	N = 115	Missing
	Unconfident/ambivalent	87 (42.0%)		49 (42.6%)	
	Somewhat confident	61 (29.5%)		38 (33.0%)	
	Fully confident	59 (28.5%)		28 (24.3%)	
Enabling	Insurance		17		9
	None	23 (12.0%)		13 (12.3%)	
	Medicaid	81 (42.4%)		48 (45.3%)	
	Medicare	19 (10.0%)		12 (11.3%)	
	Private	14 (7.3%)		5 (4.72%)	
	Other	54 (28.3%)		28 (26.4%)	
	Difficulty reading		0		0
	No	109 (52.4%)		67 (58.3%)	
	Yes	99 (47.6%)		48 (41.7%)	
	Understanding forms		0		0
	Confident	146 (70.2%)		87 (75.7%)	
	Unconfident	62 (29.8%)		28 (24.3%)	
	Medical understanding		0		0
	No problems	147 (70.7%)		86 (74.8%)	
	Some problems	61 (29.3%)		29 (25.2%)	
	Reading hospital materials		0		0
	Get help	59 (28.4%)		31 (27.0%)	
	Never get help	149 (71.6%)		84 (73.0%)	
	Kessler sum*	9.17 (5.88)	0	8.56 (5.52)	0
	Food security		1		0
	Low	49 (23.6%)		27 (23.5%)	
	Mid	67 (32.2%)		32 (27.8%)	
	High	92 (44.2%)		56 (48.7%)	
	EQ5D_Index**	0.72 (0.27)	14	0.72 (0.26)	10
	Housing status		0		0
	Housing insecure	66 (31.7%)		34 (29.6%)	
	Housing secure	142 (68.3%)		81 (70.4%)	
Need	Income		8		3
	Less than $1 k/month	76 (37.3%)		29 (25.7%)	
	More than $1 k/month	128 (62.7%)		84 (74.3%)	
	Financial distress		13		8
	Low	34 (17.4%)		17 (15.9%)	
	Mid	83 (42.6%)		50 (46.7%)	
	High	78 (40.0%)		40 (37.4%)	
	Deprivation from smoking	0.47 (0.50)	0		0
	No	110 (52.9%)		57 (53.3%)	
	Yes	98 (47.1%)		50 (46.7%)	

*Kessler sum is the sum of a 6-question screening scale of psychological distress, where each question ranges from 1 to 5. Mean and standard deviation are reported

**EQ5D_Index is an index value of relative quality of life compared with reported preferences from a given country. It ranges from −0.224 to 1 and is commonly used to calculate quality-adjusted life years for economic evaluations of healthcare interventions. Mean and standard deviation are reported

Table 2 Comparison of logistic regression models

	Dependent variable:			
	Attend counseling	Receive money management coaching	Receive referral to FEC	Receive assistance with ACCESS
	OR *[p-value]* (95% CI)	OR *[p-value]* (95% CI)	OR *[p-value]* (95% CI)	OR *[p-value]* (95% CI)
Predisposing characteristics				
Age				
Under 48	Ref			Ref
48–54	0.75 *[.56]* (0.30–1.92)			3.26 *[.72]* (0.90–11.80)
55–60	1.25 *[.62]* (0.52–3.02)			4.12 *[.02]* (1.23–13.77)
Over 60	4.20 *[<.01]* (1.58–11.20)			2.25 *[<.17]* (0.71–7.09)
Educational attainment				
Less than high school grad	Ref			
High school grad or equivalent	1.93 *[.15]* (0.79–4.76)			
At least some higher education	2.72 *[.03]* (1.13–6.55)			
Prefers speaking Spanish			0.32 *[.06]* (0.10–1.04)	
Perceived need				
Financial distress				
Low		Ref		
Medium		2.71 *[.14]* (0.73–10.06)		
High		6.92 *[.03]* (1.16–41.13)		
Economic deprivation from smoking		4.27 *[.07]* (0.87–20.85)		
Income greater than $1 k per month	2.70 [*<.01*] (1.34–5.46)			
Observations	177	107	113	105

Discussion

Social determinants of health (SDH), including financial hardship, often have greater impact on health than do medical interventions (Braveman & Gottlieb, 2014). There is growing effort among health care systems to implement programs for screening and referring patients to SDH resources (Andermann, 2018; Sundar, 2018); yet, although there is growing research interest in this area (e.g., Alexander et al., 2019; Kendzor et al., 2020), there have been few published RCTs evaluating the efficacy of interventions that directly target poor financial health to improve health behavior outcomes, such as tobacco use (Viswanathan et al., 2021). This has created a gap in empirical knowledge on how to structure such programs to optimize patient engagement, satisfaction, and impact (Viswanathan et al., 2021). This study is the first to examine factors that predict initial attendance and subsequent component uptake of an intervention that integrated financial coaching and benefits referrals into smoking cessation treatment for low-income people who smoke. Results showed that the rate of initial intervention attendance increased with participant age, education, and income. This finding is concerning, as it points to a missed opportunity to reach smokers with the lowest income and

educational levels—two populations with persistent disparities in tobacco use who may be most in need of a program that targets socio-contextual determinants of tobacco use (NCCDPHP, 2014).

A promising finding was that participants belonging to other marginalized populations did not experience disparities in initial intervention attendance. This included people who were homeless, immigrants, people who preferred Spanish language, people with high rates of psychological distress, people who were unemployed, people with lower levels of health literacy, and people with lower levels of motivation and confidence to quit smoking. Additionally, once participants attended at least one intervention session, there were few patient factors associated with uptake of the individual intervention components. Overall, the intervention engagement patterns found in the current analysis suggest that future research may need to focus on decreasing disparities in initial program attendance to ensure equitable reach and impact of multi-component financial coaching programs. Once equity in initial program attendance is achieved, research should focus on increasing access to individual intervention components across all participants.

Prior research has found that directly linking patients with financial services (available on site or virtually) may be key to

optimizing patient access and engagement (Dalembert et al., 2021). On-site services fully integrated into health programs limit the time and financial burdens on patients, and also offer increased ease of data sharing between health and financial programs. Prior research has also found that the degree of uptake of programs devoted to screening and referring patients to social needs resources can vary by the referral approach (passive versus direct or warm hand-off), the accessibility of referral sites, and the intensity of time and labor required by patients to access resources (Ruiz Escobar et al., 2021; Sanderson et al., 2021). The fact that the on-site money management coaching provided by the current program's smoking cessation counselors was the most frequently received intervention component in the current study, while the referral to an FEC was the least frequently received component, is consistent with this prior research. Many community-based FECs are now offering online or telephone-based coaching, which should reduce access barriers and help with client engagement, and there is growing research into mobile financial coaching programs that should be explored as a referral option for health care patients who are unable to attend in-person programs (Collins et al., 2017). Remote interventions like these may prove particularly important given the cultural shift toward virtual healthcare we have seen in the years since the beginning of the COVID-19 pandemic (Vosburg & Robinson, 2022). Moreover, remote interventions may have an outsize facilitative impact on attendance for those individuals who were least likely to attend sessions in our study—working-aged people, those with low incomes, and those with no higher education—as people in these groups may tend to have less flexible schedules and/or fewer resources to enable travel to in-person interventions.

One limitation of this study is the relatively small sample size. Although the parent trial included 414 participants, the analytic samples for the regression models in this study are the subset of participants randomized to the Intervention group with complete data on variables of interest.

Conclusion

This study identified factors that may influence uptake of financial coaching interventions in people with low income who smoke. Additional qualitative and quantitative research is needed to understand the mechanisms driving these relationships. Subsequent adaptations may be needed to enhance uptake of the intervention to improve its effectiveness, especially among younger smokers with lower levels of education and income.

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