

RESEARCH BRIEF

Exploring the role of discretionary income as a social determinant of health

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Abstract

Objective: The object of this study is to explore the impact of discretionary income on the overall well-being of Americans.

Data Source: The data source used for this study was 2017 Behavioral Risk Factor Surveillance System data comprising 12 states that used the Social Determinants of Health (SDOH) module.

Study Design: Multivariable logistic regression models were used to analyze the relationship between discretionary income and self-reported health status after adjusting for common SDOH measures, sociodemographic factors, chronic conditions, and perspectives and experiences of respondents regarding specific aspects of their health. Average marginal effects (AME) were reported.

Data Collection/Extraction Methods: Not applicable.

Principal Findings: At all income levels, those with discretionary income at the end of the month were 6–7 percentage points more likely to report better than average health than those with none, controlling for other factors (AME: 0.07, 95% CI: 0.02–0.12).

Conclusion: Our study suggests that discretionary income has a role to play in overall health and well-being that goes beyond that of disposable income and may be an important resource for diverse communities.

KEYWORDS

discretionary income, economic stability, population health, social determinants of health

What is known on this topic

- Efforts aimed at addressing the social determinants of health seek to improve the overall health and well-being of diverse communities.
- Socioeconomic status and income are the primary measures of economic stability in health studies.

What this study adds

- Discretionary income may be an independent correlate of self-reported health that can be used to provide a more in-depth assessment of the impact of economic stability on the well-being of Americans.
- Datasets that incorporate non-traditional social determinants of health may shed additional light on the progress being made to improve population health outcomes.

1 | INTRODUCTION

The ability to afford safe housing, quality health care, and healthy foods has been shown to impact the physical health and quality of life of diverse communities.^{1,2,3} Prior literature indicates that racial and ethnic minoritized groups and those with lower socioeconomic status (SES) report higher levels of fair or poor health than their counterparts with higher SES.^{1,3,4,5} Financial strain associated with lower SES and not being able to make ends meet is known to contribute to stress and cognitive load that results in poor physical and mental health.^{3,4,6-12} Furthermore, studies on adults lacking the financial margin needed to continue paying for their homes highlight various mental and chronic health challenges associated with financial strain.^{8,9} Although the inclusion of income in health studies can provide a general sense of the availability of disposable income (i.e., net income after taxes have been taken out) that households have available to them, few studies examine the impact of money left over after basic needs are met and the role this might play in overall health among diverse communities. A study conducted within the first few months of the COVID-19 pandemic on financial fragility, defined as the capacity to meet an unexpected midsize expense (e.g., about \$2000) within a month's time, found that almost 20% of adults reported being financially fragile.¹² Respondents that were pre-retirement age (i.e., less than 65 years old), part-time workers, had experienced a recent drop in income, had less education, were women, Black/African American, Hispanic/Latino, and low-income adults were also more likely than their counterparts to report financial fragility.¹²

While extensive research points to the importance of overall measures of individual economic status including SES and income, far less attention has been paid to the impact of discretionary income (i.e., money left over at the end of the month) on the health and well-being of diverse communities. Regardless of SES, when income sources are strained or discretionary income is unavailable to cover unexpected expenses, households are at risk of becoming dependent on publicly available resources or other social support systems that may already be struggling to meet increasing demands.^{8,9,11}

This study uses the 2017 Behavioral Risk Factor Surveillance System (BRFSS) survey data to assess the relationship between discretionary income and self-reported health status. Although many Americans have the ability to make ends meet, this is likely not enough to build the social and economic mobility that supports improved health outcomes, a better quality of life, and longer life expectancy.¹⁻⁵ Evaluating discretionary incomes, a Social Determinant of Health (SDOH) that is not traditionally studied in the public health literature, can provide insight into the impact of economic stability on self-reported health and well-being.

2 | METHODS

For this study, we conducted a secondary analysis of the 2017 BRFSS survey, using a sample of adults ages 18 and older that were asked questions from the SDOH module. The BRFSS is a nationally

representative survey. We focus on 2017 data since this is the only year that the BRFSS implemented the SDOH module and asked about discretionary income. 12 states incorporated the module into their respective state surveys: Florida, Georgia, Iowa, Massachusetts, Minnesota, Mississippi, New Hampshire, Pennsylvania, Utah, West Virginia, Wisconsin, and Wyoming.

2.1 | Key dependent and independent variables

We examined self-reported health status as our outcome variable. This was measured using the question: "Would you say that in general your health is...?" The answer choices provided were excellent, very good, good, fair, and poor and recoded to be a dichotomous variable representing better than average health (very good/excellent = 1, poor/fair/good = 0). The key independent variable was measured using the question: "In general, how do your finances work out at the end of the month? Do you find that you usually...?" The answer choices provided were to end up with money left over, have just enough money to make ends meet, and not have enough money to make ends meet. This variable was collapsed into two categories, representing the presence or absence of discretionary income at the end of the month ('End up with money left over' = 1, 'have just enough money to make ends meet' combined with 'do not have enough money to make ends meet' = 0). These variables were collapsed into two levels to ensure model specification requirements were met.

Variables that were used to represent traditional SDOH measures include income level (less than \$15,000; \$15,000 to \$24,999; \$25,000 to \$34,999; \$35,000 to \$49,999; \$50,000 to \$74,999; \$75,000 or more), an education level (no high school diploma; graduated high school; attended college or technical school; graduated from college or technical school) collapsed into a binary variable capturing any college or technical school attendance (yes = 1, no = 0), health access variables such as having a personal doctor or health care professional, length of time since visiting doctor for a routine checkup, not being able to see a doctor within the past 12 months due to cost, and neighborhood safety (collapsed into safe = 1 or unsafe = 0 from the following categories: extremely safe, safe, unsafe, extremely unsafe). We also controlled for sociodemographic factors such as age group, race, and ethnicity (i.e., non-Hispanic Black, non-Hispanic White, non-Hispanic Asian, non-Hispanic American Indian/Alaskan native, non-Hispanic Other, and Hispanic),^{5,14} marital status, children in the household, sex, health insurance coverage, which is designed to offer some financial protection to individuals and households that could experience significant health challenges, and employment status (collapsed into currently employed = 1 and not currently employed = 0 from employed, out of work, a homemaker, a student, retired, and unable to work).

To account for the impact of physical health status on self-reported health and wellbeing, we added dummy variables for asthma, diabetes, arthritis, cancer, 'chronic obstructive pulmonary disease, emphysema or chronic bronchitis (COPD)', heart disease, and depressive disorders to our model as well (yes = 1, no = 0).¹⁵

TABLE 1 Descriptive and bivariate analysis of population characteristics stratified by the self-reported health status, 2017

	Total (N = 85,380), %	Good or less (N = 42,605), %	Very good or more (N = 42,775), %	p-value
<i>Discretionary income</i>				<0.001
No	47.4	29.2	18.2	
Yes	52.6	20.7	31.9	
<i>Male</i>				<0.001
No	51.5	25.6	25.9	
Yes	48.5	23.8	24.7	
<i>Age level</i>				<0.001
18 to 24	12.4	4.80	7.60	
25 to 34	16.6	7.00	9.70	
35 to 44	15.6	7.00	8.70	
45 to 54	16.1	8.20	7.90	
55 to 64	17.0	9.50	7.50	
65 to 74	12.8	7.2	5.60	
75 or older	9.40	5.80	3.60	
<i>Race</i>				<0.001
Non-Hispanic, White	70.4	33.0	37.4	
Non-Hispanic, Black	12.7	7.0	5.7	
Non-Hispanic, Asian	3.2	1.5	1.7	
Non-Hispanic, American Indian/Alaskan native	0.60	0.40	0.20	
Hispanic	11.5	6.7	4.8	
Non-Hispanic, Other race	1.7	0.90	0.80	
<i>Children in household</i>				<0.001
None	65.4	33.9	31.6	
1 or more	34.6	15.6	19.0	
<i>Marital status</i>				<0.001
Currently married	49.4	26.4	23.0	
Not currently married	50.6	23.0	27.6	
<i>Income level</i>				<0.001
Less than \$15,000	9.4	7.0	2.4	
\$15,000 to \$24,999	17.6	11.4	6.2	
\$25,000 to \$34,999	11.0	6.1	4.9	
\$35,000 to \$49,999	13.7	6.8	6.8	
\$50,000 to \$74,999	15.1	6.6	8.6	
\$75,000 or more	33.2	10.6	22.6	
<i>Employment status</i>				<0.001
Not currently employed	43.1	25.7	17.5	
Currently employed	56.9	23.7	33.1	
<i>Education (some college or technical school)</i>				<0.001
No	42.1	25.6	16.5	
Yes	57.9	23.8	34.1	
<i>Insurance status</i>				<0.001
Not insured	11.6	6.70	5.00	
Insured	88.4	42.7	45.6	
<i>Safe neighborhood</i>				<0.001
Unsafe	5.40	3.70	1.70	
Safe	94.6	4.60	4.80	
<i>Delayed doctor visit due to cost</i>				<0.001
No	86.7	40.4	46.4	
Yes	13.3	9.0	4.3	

TABLE 1 (Continued)

	Total (N = 85,380), %	Good or less (N = 42,605), %	Very good or more (N = 42,775), %	p-value
<i>Time since last routine check-up</i>				<0.001
Within 1 year	73.0	37.0	36.0	
Within 2 years	12.1	5.3	6.8	
2 or more	14.9	7.0	7.9	
<i>Personal health care provider</i>				0.007
No	22.2	10.6	11.6	
Yes	77.8	38.8	39.0	
<i>Diabetes</i>				<0.001
No	89.7	41.0	48.7	
Yes	10.3	8.4	1.9	<0.001
<i>Asthma</i>				<0.001
No	86.3	41.0	45.3	
Yes	13.7	8.4	5.3	<0.001
<i>Arthritis</i>				<0.001
No	74.9	31.9	43.0	
Yes	25.1	17.4	7.7	
<i>Heart disease</i>				<0.001
No	95.6	45.5	50.1	
Yes	4.4	3.6	0.8	
<i>Cancer</i>				<0.001
No	92.7	44.3	48.5	
Yes	7.3	5.1	2.2	
<i>COPD</i>				<0.001
No	93.2	43.8	49.5	
Yes	6.8	5.5	1.3	
<i>Depressive disorders</i>				<0.001
No	81.4	36.7	44.7	
Yes	18.6	12.7	5.9	<0.001
<i>Days physical health not good</i>				<0.001
0 days	64.2	24.7	39.5	
1 to 13 days	24.5	14.1	10.4	
14 to 30 days	11.3	10.1	1.2	
<i>Days mental health not good</i>				<0.001
0 days	65.0	28.5	36.5	
1 to 13 days	23.3	11.7	11.6	
14 to 30 days	11.7	8.9	2.8	
<i>Difficulty in making decisions etc. due to health conditions</i>				<0.001
No	88.4	40.1	48.3	
Yes	11.6	9.1	2.5	

Note: Weights were used to adjust for nonresponse bias and non-coverage errors, surveys conducted by cell phone, and state-level demographic characteristics.

Select variables were used to incorporate the perspectives and experiences of respondents regarding specific aspects of their health beyond having chronic conditions: self-reported poor physical health days, self-reported poor mental health days, and difficulty making decisions due to a health condition.^{16,17} Self-reported poor physical health was measured using the following question: “Now thinking about your physical health, which includes physical illness and injury,

for how many days during the past 30 days was your physical health not good?” This was collapsed into a three-category variable (i.e., 0, 1–13, 14–30 days) representing worsening physical health. Cognitive wellness was also assessed using the question: “Now, thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” This was collapsed into a three-level

variable with the following clinically relevant categories: none, 1–13 days, or 14–30 days based on its importance in prior population health studies.^{16,17} Difficulty making decisions due to a health condition was assessed using the question: “Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?” The answer choices were no or yes.

2.2 | Statistical methodology

Weighted frequencies and percentages were calculated for each covariate and Pearson chi-square tests were used to assess the relationship between the covariates of interest and self-reported health status. Multivariable logistic regression models were run and average marginal effects for the association between monthly discretionary income and self-reported health status were generated. Model 1 controlled for traditional SDOH measures and sociodemographic variables that are relevant in the literature. Model 2 included measures from Model 1 as well as chronic health conditions and select health status measures used to assess the separate impact of the perspectives and experiences of respondents on different aspects of their health. As a robustness check, we ran a model without the measures capturing the perspectives and experiences of respondents on different aspects of their health. Multicollinearity was assessed using variance inflation factors (VIF) for independent variables. Model specification error was assessed using the link test option in Stata version 17 (College Station, Texas) to ensure that adequate specification was met for the models included in our results. BRFSS sampling weights were employed to account for the design of the survey and characteristics of the population using raking, or iterative proportional fitting. We adjusted for variation across states using state-fixed effects.

3 | RESULTS

Descriptive statistics are reported in Table 1 as weighted frequencies. The final dataset had 85,380 observations, representing a population of 47 million Americans across 12 states. 50.1% of respondents reported having better than average health. 52.6% of respondents reported having a monthly discretionary income. 70.4% of respondents were White, 11.5% were Hispanic, females made up 51.5% of respondents, and 27.0% of respondents had household incomes of less than \$25,000. Individuals in the 55–64 (17.0%) and 25–34 age groups (16.6%) made up the largest proportion of respondents. 65.4% of respondents had no children under the age of 18 in the household and 50.6% were currently married. 56.9% of respondents were currently employed, 94.6% of respondents reported living in a safe neighborhood, 57.9% of respondents had any college or technical school attendance, and 88.4% of respondents were insured. 25.1% of respondents reported ever being diagnosed with arthritis. This was followed by ever being diagnosed with a depressive disorder (18.8%),

asthma (13.7%), or diabetes (10.3%). 39.5% and 36.5% of respondents reported having zero poor mental health and physical health days, respectively. 11.6% reported having difficulties making decisions due to a health condition.

The results of our bivariate analyses revealed that respondents with a monthly discretionary income had higher proportions of better than average health (31.9% vs. 18.2%) and lower proportions of good and poorer health (20.7% vs. 29.2%) compared to those without it. Our SDOH measures, sociodemographic factors, and select health perspective and experience measures were also associated with self-reported health.

Tables 2 and 3 present average marginal effects after running multivariable logistic regression models for each income level. After controlling for age, sex, race and ethnicity, marital status, educational attainment, insurance status, neighborhood safety, health care access, employment status, presence of children in the household, chronic conditions, and state-level variation (Table 2), respondents with monthly discretionary income were more likely to report better than average health than those without it. Those with monthly discretionary income that were making less than \$50,000 reported an 11–12 percentage point increase in better than average health and those with monthly discretionary income that were making \$50,000 or more reported a 9-percentage point increase in better than average health. Adding in chronic conditions and measures for the perspectives and experiences of respondents regarding specific aspects of their health (Table 3) resulted in an overall increase in better than average health of about 6–7 percentage points across all included income levels for those with monthly discretionary income (Appendix B). The robustness check we conducted, by removing measures reflecting the perspectives and experiences of respondents regarding specific aspects of their health, revealed a 9–10 percentage point increase in better than average health for those with monthly discretionary income that were making less than \$50,000. However, the increase in better than average health for those with monthly discretionary income that were making \$50,000 or more remained at 6–7 percentage points (Appendix B).

In our final model, attending some college or technical school was associated with better-reported health across all income levels. At an income of \$35,000 or higher, reports of better than average health were lower among Black and Asian respondents compared to White respondents (10–13 and 18–32 percentage points lower, respectively). This held true for Hispanic respondents making incomes between \$15,000 and \$35,000 and American Indian/Alaskan native respondents making incomes between \$25,000 to \$35,000 (12–14 and 24 percentage points lower, respectively). Being female compared to male and 18–24 years old compared to older age groups were associated with better-reported health. Although there was some variation, chronic conditions were associated with poorer health across all income levels as were self-reported physical and mental health days and having difficulty making decisions due to a chronic condition. The final model had adequate specification across all included income levels and multicollinearity was determined to not be an issue (Appendix A).

TABLE 2 Association of discretionary income and better than average health per income level after controlling for social determinants of health and sociodemographic factors

Model 1	\$15,000 to \$24,999		\$35,000 to \$49,999		\$50,000 to \$74,999		\$75,000 or more	
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value
<i>Discretionary income (Ref: No)</i>								
Yes	0.12 (0.07 to 0.17)	<0.001	0.11 (0.07 to 0.15)	<0.001	0.11 (0.07 to 0.15)	<0.001	0.09 (0.06 to 0.12)	<0.001
<i>Race and ethnicity (Ref: Non-Hispanic, White)</i>								
Non-Hispanic, Black	0.07 (0.00 to 0.14)	0.039	0.04 (-0.01 to 0.09)	0.147	-0.06 (-0.13 to 0.02)	0.122	0.03 (-0.04 to 0.09)	0.387
Non-Hispanic, Asian	0.01 (-0.14 to 0.15)	0.938	0.01 (-0.13 to 0.15)	0.915	-0.29 (-0.44 to -0.14)	<0.001	-0.01 (-0.16 to 0.15)	0.946
Non-Hispanic, American Indian/Alaskan native	0.07 (-0.07 to 0.21)	0.325	-0.01 (-0.13 to 0.11)	0.837	-0.10 (-0.33 to 0.13)	0.393	-0.13 (-0.30 to 0.04)	0.133
Hispanic	-0.03 (-0.09 to 0.04)	0.382	-0.07 (-0.13 to -0.01)	0.018	0.00 (-0.09 to 0.10)	0.954	-0.03 (-0.14 to 0.08)	0.561
Non-Hispanic, Other race	-0.07 (-0.14 to 0.01)	0.108	0.07 (-0.05 to 0.18)	0.253	-0.07 (-0.19 to 0.05)	0.235	-0.01 (-0.11 to 0.10)	0.919
<i>Age group (References 18-24)</i>								
25 to 34	-0.15 (-0.25 to -0.04)	0.007	-0.12 (-0.20 to -0.04)	0.004	-0.06 (-0.15 to 0.04)	0.26	-0.06 (-0.13 to 0.02)	0.144
35 to 44	-0.28 (-0.39 to -0.18)	<0.001	-0.19 (-0.28 to -0.11)	<0.001	-0.09 (-0.19 to 0.01)	0.066	-0.14 (-0.22 to -0.06)	<0.001
45 to 54	-0.30 (-0.40 to -0.20)	<0.001	-0.29 (-0.38 to -0.21)	<0.001	-0.18 (-0.28 to -0.08)	<0.001	-0.20 (-0.28 to -0.12)	<0.001
55 to 64	-0.36 (-0.46 to -0.27)	<0.001	-0.31 (-0.39 to -0.24)	<0.001	-0.18 (-0.27 to -0.09)	<0.001	-0.28 (-0.35 to -0.21)	<0.001
65 to 74	-0.26 (-0.37 to -0.16)	<0.001	-0.28 (-0.35 to -0.20)	<0.001	-0.16 (-0.25 to -0.07)	0.001	-0.19 (-0.26 to -0.11)	<0.001
75 or older	-0.22 (-0.33 to -0.10)	<0.001	-0.21 (-0.29 to -0.13)	<0.001	-0.16 (-0.26 to -0.07)	0.001	-0.20 (-0.28 to -0.11)	<0.001
<i>Male (Ref: No)</i>								
Yes	0.04 (-0.01 to 0.08)	0.083	-0.04 (-0.08 to 0.00)	0.028	-0.04 (-0.08 to 0.00)	0.037	-0.05 (-0.08 to -0.01)	0.011
<i>Married (Ref: No)</i>								
Yes	-0.02 (-0.08 to 0.04)	0.445	0.02 (-0.02 to 0.06)	0.325	0.02 (-0.02 to 0.06)	0.349	0.03 (0.0 to 0.07)	0.083
<i>Employed (Ref: No)</i>								
Yes	0.05 (-0.01 to 0.10)	0.096	0.10 (0.06 to 0.14)	<0.001	0.08 (0.03 to 0.12)	0.001	0.08 (0.03 to 0.12)	0.001
<i>College (Ref: No)</i>								
Yes	0.10 (0.06 to 0.15)	<0.001	0.09 (0.05 to 0.12)	<0.001	0.1 (0.06 to 0.14)	<0.001	0.05 (0.01 to 0.09)	0.018
<i>Insured (Ref: No)</i>								
Yes	-0.01 (-0.08 to 0.06)	0.732	-0.01 (-0.06 to 0.04)	0.722	-0.02 (-0.09 to 0.06)	0.69	-0.06 (-0.14 to 0.01)	0.095
<i>Length of time since last routine checkup (Ref: Within past year)</i>								
Less than 2 years	-0.03 (-0.10 to 0.04)	0.392	0.03 (-0.02 to 0.09)	0.243	0.02 (-0.04 to 0.09)	0.53	0.04 (-0.01 to 0.1)	0.089
2 or more years	0.01 (-0.05 to 0.07)	0.798	0.02 (-0.04 to 0.07)	0.559	0.02 (-0.05 to 0.08)	0.578	0.04 (-0.02 to 0.10)	0.155

(Continues)

TABLE 2 (Continued)

Model 1	Less \$15,000		\$15,000 to \$24,999		\$35,000 to \$49,999		\$50,000 to \$74,999		\$75,000 or more	
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value
<i>Could not see doctor because of cost (Ref: No)</i>										
Yes	0.03 (-0.01 to 0.07)	0.118	0.07 (0.02 to 0.13)	0.005	0.09 (0.02 to 0.15)	0.006	0.18 (0.13 to 0.24)	<0.001	0.08 (0.02 to 0.13)	0.006
<i>Personal doctor or health care provider (Ref: No)</i>										
Yes	-0.05 (-0.11 to 0.01)	0.086	-0.01 (-0.07 to 0.04)	0.649	-0.05 (-0.11 to 0.02)	0.148	-0.05 (-0.1 to 0.01)	0.08	-0.02 (-0.06 to 0.02)	0.406
<i>Safe neighborhood (Ref: No)</i>										
Yes	0.04 (-0.03 to 0.10)	0.28	0.04 (-0.03 to 0.11)	0.286	0.10 (0.01 to 0.19)	0.035	0.16 (0.04 to 0.28)	0.01	0.08 (-0.02 to 0.19)	0.103

Note: Only models with adequate specification based on the link test option (χ^2 , $p < 0.05$; _hat_{sq} , $\text{_hat}_{sq} = p > 0.05$) in Stata and a variance inflation factor (VIF) of less than 10 were included in the results. Abbreviations: AME, average marginal effects; CI, confidence interval.

4 | DISCUSSION

Our study suggests that monthly discretionary income is associated with better self-reported health across income levels, demonstrating its value as a measure of economic stability and its potential for improving population health outcomes.

Incorporating self-reported poor physical health days, self-reported poor mental health days, and difficulty making decisions due to a health condition canceled out the contribution of other SDOHs except for education. Although sociodemographic factors such as age and gender were statistically significant across most levels of our models, race, and ethnicity made a more limited contribution to self-reported health. However, at both higher and lower income levels, various racial and ethnic minoritized groups still experienced disparities in very good or excellent well-being compared to the White, non-Hispanic population. This result could reflect structural racism, which has prevented and delayed various racial and ethnic minoritized groups from acquiring and maintaining health and wealth throughout their life course.^{18,19} It also highlights the differential impact that these barriers have on specific racial and ethnic minoritized groups.¹⁸ The contribution of chronic conditions except for depressive disorders remained relatively consistent across income levels.

These findings suggest that even though Americans at different ends of the income scale may be able to make ends meet, not having enough financial margins could uniquely contribute to poorer overall well-being. Likewise, the presence of chronic conditions as well as the negative perspectives and experiences of individuals as it relates to their physical and mental health suggest barriers to overall wellbeing even when other financial, health care, and social supports may be available. Since monthly discretionary income and some college or technical school were identified as the only consistent facilitators of overall well-being in our final model, this may reveal the importance that Americans place on financial margin and higher education as it relates to their overall well-being.

Although more research is needed due to the cross-sectional nature of our study, exploring policies that can help marginalized communities build financial margins and pursue educational options that support this aligns with the overall goals of the SDOH framework to ensure that health is accessible to all. There is literature that suggests that health and financial literacy interventions targeted toward disadvantaged communities should be multidisciplinary, delivered by trusted community organizations, and incorporate peer support.^{13,20} Social support and activity have also been reported as being beneficial for learning and applying financial literacy concepts while improving mental health.^{6,13,22}

Our study is also relevant for discussions around universal basic income in the U.S. In order to reach the goal of increasing discretionary income for all Americans, universal basic income interventions could potentially be improved by offering optional opportunities to participate in reputable financial literacy programs.^{13,21,22} In the absence of this, the additional income could disproportionately benefit those who are already financially literate or actively seeking ways to build financial margin thus leading to further disparities.^{12,13}

TABLE 3 Association of discretionary income and better than average health per income level after controlling for social determinants of health, sociodemographic factors, chronic health conditions, and perspectives and experiences of respondents regarding specific aspects of their health

Model 2	Less \$15,000		\$15,000 to \$24,999		\$25,000 to \$34,999		\$35,000 to \$49,999		\$75,000 or more	
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value
<i>Discretionary income (Ref: No)</i>										
Yes	0.07 (0.02 to 0.12)	0.008	0.06 (0.02 to 0.10)	0.003	0.07 (0.02 to 0.11)	0.002	0.07 (0.03 to 0.1)	<0.001	0.06 (0.03 to 0.08)	<0.001
<i>Race and ethnicity (Ref: Non-Hispanic, White)</i>										
Non-Hispanic, Black	0.02 (-0.04 to 0.07)	0.585	-0.03 (-0.08 to 0.02)	0.24	-0.05 (-0.13 to 0.02)	0.142	-0.1 (-0.17 to -0.03)	0.005	-0.13 (-0.2 to -0.07)	<0.001
Non-Hispanic, Asian	-0.01 (-0.17 to 0.15)	0.907	-0.08 (-0.21 to 0.05)	0.214	-0.16 (-0.34 to 0.02)	0.077	-0.32 (-0.46 to -0.17)	<0.001	-0.18 (-0.26 to -0.09)	<0.001
Non-Hispanic, American Indian/Alaskan native	0.10 (-0.04 to 0.25)	0.16	-0.03 (-0.17 to 0.11)	0.695	-0.24 (-0.36 to -0.12)	<0.001	-0.02 (-0.2 to 0.15)	0.792	0.06 (-0.21 to 0.33)	0.679
Hispanic	-0.02 (-0.09 to 0.04)	0.465	-0.12 (-0.17 to -0.07)	<0.001	-0.14 (-0.22 to -0.07)	<0.001	-0.03 (-0.12 to 0.05)	0.455	-0.05 (-0.12 to 0.02)	0.177
Non-Hispanic, Other race	-0.05 (-0.14 to 0.05)	0.351	0.03 (-0.07 to 0.13)	0.505	-0.15 (-0.31 to 0.02)	0.077	-0.06 (-0.17 to 0.04)	0.235	-0.03 (-0.11 to 0.06)	0.558
<i>Age group (References 18-24)</i>										
25 to 34	-0.08 (-0.16 to 0.00)	0.064	-0.07 (-0.15 to 0.00)	0.044	-0.02 (-0.12 to 0.08)	0.69	-0.04 (-0.13 to 0.05)	0.341	-0.07 (-0.12 to -0.01)	0.016
35 to 44	-0.15 (-0.23 to -0.06)	0.001	-0.12 (-0.2 to -0.04)	0.004	-0.09 (-0.19 to 0.01)	0.092	-0.08 (-0.17 to 0.01)	0.076	-0.08 (-0.13 to -0.02)	0.004
45 to 54	-0.15 (-0.23 to -0.07)	<0.001	-0.18 (-0.26 to -0.10)	<0.001	-0.10 (-0.2 to 0.00)	0.057	-0.15 (-0.24 to -0.06)	0.001	-0.09 (-0.14 to -0.03)	0.002
55 to 64	-0.22 (-0.29 to -0.14)	<0.001	-0.20 (-0.27 to -0.13)	<0.001	-0.10 (-0.2 to 0.00)	0.056	-0.11 (-0.2 to -0.03)	0.008	-0.08 (-0.13 to -0.02)	0.004
65 to 74	-0.17 (-0.26 to -0.09)	<0.001	-0.21 (-0.28 to -0.13)	<0.001	-0.15 (-0.25 to -0.04)	0.008	-0.09 (-0.18 to -0.01)	0.034	-0.07 (-0.13 to -0.02)	0.008
75 or older	-0.13 (-0.22 to -0.03)	0.008	-0.14 (-0.21 to -0.06)	0.001	-0.12 (-0.23 to -0.01)	0.028	-0.11 (-0.2 to -0.02)	0.017	-0.08 (-0.15 to -0.02)	0.014
<i>Male (Ref: No)</i>										
Yes	0.02 (-0.03 to 0.06)	0.428	-0.05 (-0.08 to -0.01)	0.011	-0.06 (-0.1 to -0.02)	0.004	-0.05 (-0.09 to -0.02)	0.003	-0.09 (-0.11 to -0.06)	<0.001
<i>Married (Ref: No)</i>										
Yes	-0.04 (-0.1 to 0.01)	0.118	0.01 (-0.03 to 0.04)	0.712	0.00 (-0.05 to 0.04)	0.852	0 (-0.03 to 0.04)	0.872	-0.02 (-0.05 to 0.01)	0.177
<i>Employed (Ref: No)</i>										
Yes	-0.03 (-0.07 to 0.02)	0.308	0.03 (-0.01 to 0.07)	0.106	0.03 (-0.02 to 0.09)	0.229	0.02 (-0.03 to 0.06)	0.488	0.01 (-0.02 to 0.04)	0.51
<i>College (Ref: No)</i>										
Yes	0.09 (0.04 to 0.13)	<0.001	0.08 (0.05 to 0.12)	<0.001	0.14 (0.10 to 0.19)	<0.001	0.1 (0.07 to 0.14)	<0.001	0.09 (0.06 to 0.12)	<0.001
<i>Insured (Ref: No)</i>										
Yes	0.02 (-0.04 to 0.08)	0.538	-0.01 (-0.06 to 0.04)	0.756	-0.01 (-0.08 to 0.06)	0.733	0 (-0.06 to 0.07)	0.945	-0.02 (-0.08 to 0.04)	0.534
<i>Length of time since last routine checkup (Ref: Within past year)</i>										
Less than 2 years	-0.04 (-0.11 to 0.03)	0.297	0.01 (-0.04 to 0.07)	0.619	0.02 (-0.05 to 0.09)	0.649	0 (-0.06 to 0.06)	0.946	0.01 (-0.02 to 0.04)	0.556
2 or more years	0.01 (-0.04 to 0.07)	0.652	-0.01 (-0.06 to 0.04)	0.7	-0.02 (-0.09 to 0.04)	0.507	0.01 (-0.05 to 0.07)	0.73	0.00 (-0.03 to 0.04)	0.832

(Continues)

TABLE 3 (Continued)

Model 2	\$15,000 to \$24,999		\$25,000 to \$34,999		\$35,000 to \$49,999		\$75,000 or more			
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value		
<i>Could not see doctor because of cost (Ref: No)</i>										
Yes	-0.01 (-0.07 to 0.06)	0.79	0.06 (0.02 to 0.10)	0.003	0.05 (0.00 to 0.11)	0.057	0.01 (-0.03 to 0.05)	0.515	0.02 (-0.03 to 0.06)	0.498
<i>Personal doctor or health care provider (Ref: No)</i>										
Yes	-0.01 (-0.06 to 0.04)	0.73	0.00 (-0.05 to 0.05)	0.899	-0.02 (-0.08 to 0.04)	0.544	-0.01 (-0.06 to 0.05)	0.828	0.01 (-0.03 to 0.04)	0.68
<i>Safe neighborhood (Ref: No)</i>										
Yes	0.01 (-0.05 to 0.07)	0.818	-0.04 (-0.11 to 0.03)	0.269	0.08 (-0.02 to 0.18)	0.118	0.07 (-0.02 to 0.16)	0.144	0.02 (-0.09 to -0.13)	0.757
<i>Depressive (Ref: No)</i>										
	0.02 (-0.04 to 0.08)	0.544	-0.03 (-0.08 to 0.02)	0.2	-0.04 (-0.10 to 0.01)	0.143	-0.04 (-0.09 to 0.02)	0.164	-0.08 (-0.11 to -0.04)	<0.001
<i>Asthma (Ref: No)</i>										
	-0.07 (-0.12 to -0.01)	0.019	-0.02 (-0.08 to 0.03)	0.367	-0.07 (-0.14 to -0.01)	0.021	-0.07 (-0.14 to -0.01)	0.029	-0.06 (-0.09 to -0.02)	0.001
<i>COPD (Ref: No)</i>										
	-0.08 (-0.14 to -0.01)	0.021	-0.12 (-0.18 to -0.05)	<0.001	-0.10 (-0.19 to -0.01)	0.024	-0.20 (-0.28 to -0.12)	<0.001	-0.15 (-0.22 to -0.07)	<0.001
<i>Cancer (Ref: No)</i>										
	-0.04 (-0.11 to 0.03)	0.227	-0.14 (-0.2 to -0.09)	<0.001	-0.13 (-0.2 to -0.05)	0.001	-0.13 (-0.18 to -0.07)	<0.001	-0.12 (-0.17 to -0.08)	<0.001
<i>Arthritis (Ref: No)</i>										
	-0.02 (-0.07 to 0.03)	0.477	-0.07 (-0.11 to -0.04)	<0.001	-0.07 (-0.12 to -0.03)	0.002	-0.1 (-0.14 to -0.06)	<0.001	-0.11 (-0.13 to -0.08)	<0.001
<i>Diabetes (Ref: No)</i>										
	0.05 (0.03 to 0.08)	<0.001	0.05 (0.02 to 0.07)	<0.001	0.06 (0.03 to 0.08)	<0.001	0.11 (0.08 to 0.14)	<0.001	0.08 (0.06 to 0.10)	<0.001
<i>Poor physical health days (Ref: None)</i>										
1 to 14 days	-0.13 (-0.18 to -0.08)	<0.001	-0.15 (-0.19 to -0.11)	<0.001	-0.12 (-0.17 to -0.06)	<0.001	-0.10 (-0.14 to -0.06)	<0.001	-0.12 (-0.15 to -0.10)	<0.001
15 to 30 days	-0.26 (-0.32 to -0.20)	<0.001	-0.28 (-0.33 to -0.23)	<0.001	-0.28 (-0.36 to -0.21)	<0.001	-0.32 (-0.37 to -0.26)	<0.001	-0.43 (-0.48 to -0.37)	<0.001
<i>Poor mental health days (Ref: No)</i>										
1 to 14 days	-0.04 (-0.09 to 0.02)	0.166	-0.02 (-0.07 to 0.03)	0.357	-0.05 (-0.11 to 0.00)	0.047	-0.06 (-0.11 to -0.01)	0.012	-0.05 (-0.08 to -0.02)	<0.001
15 to 30 days	-0.14 (-0.20 to -0.07)	<0.001	-0.1 (-0.15 to -0.04)	0.001	-0.15 (-0.22 to -0.08)	<0.001	-0.15 (-0.23 to -0.08)	<0.001	-0.11 (-0.17 to -0.05)	0.001
<i>Difficulty making decisions (Ref: No)</i>										
Yes	-0.03 (-0.09 to 0.02)	0.213	-0.06 (-0.12 to 0.00)	0.046	-0.06 (-0.13 to 0.02)	0.133	-0.15 (-0.22 to -0.07)	<0.001	-0.12 (-0.18 to -0.07)	<0.001

Note: Only models with adequate specification based on the link test option ($\hat{\mu}$, $p < 0.05$; $\hat{\mu}_{\text{hat}}$, $p > 0.05$) in Stata and a variance inflation factor (VIF) of less than 10 were included in the results. Abbreviations: AME, average marginal effects; CI, confidence interval.

4.1 | Limitations

A limitation of this study is that we used cross-sectional survey data and are unable to establish causality. Additionally, data was only available for one year. Recall bias may also be present due to respondents not being able to accurately remember all their answers to the survey questions, however, the questions asked in the survey are designed to factor in meaningful time periods. The 2017 BRFSS provides a unique opportunity to evaluate non-traditional SDOH measures using the data available. The 12 states that chose to include the module represented various regions of the U.S. Moving forward, our study can lay the groundwork for future research that is more national in scope.

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APPENDIX A: TEST FOR MULTICOLLINEARITY

Model 2	
Variable Name	VIF
<i>Discretionary income</i>	1.20
<i>Time since last routine check-up</i>	
Within 2 years	1.08
2 or more	1.29
<i>Delayed doctor visit due to cost</i>	1.12
<i>Personal health care provider</i>	1.38
<i>Marital status</i>	1.19
<i>Employment status</i>	1.60
<i>Education (Any College or Technical School)</i>	1.12
<i>Insured</i>	1.24
<i>Depressive</i>	1.39
<i>Asthma</i>	1.10
<i>COPD</i>	1.19
<i>Cancer</i>	1.07
<i>Arthritis</i>	1.31
<i>Diabetes</i>	1.11
<i>Days physical health not good</i>	
1 to 13 days	1.14
14 to 30 days	1.39
<i>Days mental health not good</i>	
1 to 13 days	1.21
14 to 30 days	1.49
<i>Difficulty making decisions</i>	1.34
<i>Age group</i>	
18 to 24	2.71
25 to 34	3.06
35 to 44	3.64
45 to 54	4.56
55 to 64	4.69
65 to 74	3.77
<i>Sex</i>	1.08
<i>Race and ethnicity</i>	
Non-Hispanic, Black	1.16
Non-Hispanic, Asian	1.02
Non-Hispanic, American Indian/Alaskan native	1.01
Hispanic	1.12
Non-Hispanic, Other race	1.01
<i>Safe neighborhood</i>	
<i>State</i>	
Georgia	1.21
Iowa	1.31
Massachusetts	1.26
Minnesota	1.60

Model 2	
Variable Name	VIF
Mississippi	1.22
New Hampshire	1.24
Pennsylvania	1.26
Utah	1.43
West Virginia	1.25
Wisconsin	1.23
Wyoming	1.20
Mean VIF	1.57

APPENDIX B: ASSOCIATION OF DISCRETIONARY INCOME AND VERY GOOD OR HIGHER HEALTH PER INCOME LEVEL AFTER CONTROLLING FOR SOCIAL DETERMINANTS OF HEALTH, SOCIODEMOGRAPHIC FACTORS, AND CHRONIC HEALTH CONDITIONS

Model 3	\$15,000 to \$24,999		\$25,000 to \$34,999		\$35,000 to \$49,999		\$50,000 to \$74,999		\$75,000 or more			
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value		
<i>Discretionary income (Ref: No)</i>												
Yes	0.09 (0.04 to 0.14)	<0.001	0.08 (0.04 to 0.12)	<0.001	0.1 (0.06 to 0.15)	<0.001	0.09 (0.05 to 0.13)	<0.001	0.06 (0.03 to 0.10)	<0.001	0.07 (0.04 to 0.09)	<0.001
<i>Race and ethnicity (Ref: Non-Hispanic, White)</i>												
Non-Hispanic, Black	0.04 (-0.02 to 0.11)	0.187	-0.01 (-0.06 to 0.04)	0.762	-0.04 (-0.11 to 0.04)	0.321	-0.07 (-0.15 to 0.00)	0.045	0.00 (-0.06 to 0.06)	0.982	-0.13 (-0.19 to -0.07)	<0.001
Non-Hispanic, Asian	-0.03 (-0.16 to 0.1)	0.614	-0.05 (-0.18 to 0.07)	0.416	-0.13 (-0.31 to -0.05)	0.163	-0.31 (-0.45 to -0.17)	<0.001	-0.06 (-0.2 to 0.07)	0.368	-0.15 (-0.24 to -0.07)	<0.001
Non-Hispanic, American Indian/Alaskan native	0.1 (-0.06 to 0.25)	0.22	0.01 (-0.13 to 0.14)	0.898	-0.25 (-0.37 to -0.13)	<0.001	-0.03 (-0.2 to 0.15)	0.747	-0.11 (-0.27 to 0.06)	0.195	0.05 (-0.25 to 0.34)	0.757
Hispanic	-0.03 (-0.09 to 0.04)	0.412	-0.11 (-0.16 to -0.05)	<0.001	-0.14 (-0.21 to -0.07)	<0.001	-0.02 (-0.11 to 0.07)	0.675	-0.09 (-0.19 to 0.01)	0.071	-0.05 (-0.13 to 0.03)	0.222
Non-Hispanic, Other race	-0.04 (-0.14 to 0.05)	0.378	0.05 (-0.06 to 0.15)	0.379	-0.13 (-0.33 to 0.08)	0.225	-0.05 (-0.16 to 0.07)	0.446	-0.01 (-0.11 to 0.1)	0.889	-0.03 (-0.12 to 0.07)	0.589
<i>Age group (Ref: 18-24)</i>												
25 to 34	-0.09 (-0.18 to 0.00)	0.048	-0.08 (-0.16 to 0.00)	0.045	0.01 (-0.09 to 0.10)	0.881	-0.04 (-0.13 to 0.05)	0.367	-0.04 (-0.12 to 0.03)	0.293	-0.07 (-0.13 to -0.01)	0.017
35 to 44	-0.2 (-0.29 to -0.10)	<0.001	-0.14 (-0.22 to -0.06)	0.001	-0.07 (-0.17 to 0.03)	0.154	-0.06 (-0.15 to 0.03)	0.175	-0.09 (-0.17 to -0.01)	0.021	-0.08 (-0.14 to -0.02)	0.007
45 to 54	-0.2 (-0.29 to -0.11)	<0.001	-0.2 (-0.28 to -0.13)	<0.001	-0.08 (-0.18 to 0.02)	0.106	-0.13 (-0.23 to -0.04)	0.007	-0.13 (-0.21 to -0.06)	0.001	-0.08 (-0.14 to -0.02)	0.005
55 to 64	-0.26 (-0.34 to -0.17)	<0.001	-0.2 (-0.28 to -0.13)	<0.001	-0.07 (-0.16 to 0.03)	0.176	-0.09 (-0.17 to 0.00)	0.055	-0.17 (-0.24 to -0.09)	<0.001	-0.06 (-0.12 to -0.01)	0.031
65 to 74	-0.17 (-0.27 to -0.07)	0.001	-0.17 (-0.24 to -0.09)	<0.001	-0.1 (-0.19 to 0.00)	0.062	-0.05 (-0.13 to 0.04)	0.297	-0.06 (-0.14 to 0.02)	0.171	-0.04 (-0.1 to 0.02)	0.175
75 or older	-0.13 (-0.24 to -0.03)	0.011	-0.11 (-0.19 to -0.02)	0.011	-0.08 (-0.18 to 0.02)	0.117	-0.06 (-0.15 to 0.03)	0.193	-0.07 (-0.16 to 0.02)	0.124	-0.05 (-0.13 to 0.02)	0.132
<i>Male (Ref: No)</i>												
Yes	0.02 (-0.02 to 0.06)	0.359	-0.05 (-0.09 to -0.02)	0.003	-0.06 (-0.1 to -0.02)	0.006	-0.06 (-0.09 to -0.02)	0.003	-0.06 (-0.1 to -0.03)	<0.001	-0.08 (-0.11 to -0.06)	<0.001
<i>Married (Ref: No)</i>												
Yes	-0.03 (-0.08 to 0.03)	0.346	0.01 (-0.03 to 0.04)	0.768	0 (-0.05 to 0.04)	0.982	0.01 (-0.03 to 0.05)	0.685	0.01 (-0.02 to 0.05)	0.504	-0.01 (-0.04 to 0.02)	0.652
<i>Employed (Ref: No)</i>												
Yes	0.00 (-0.05 to 0.05)	0.925	0.06 (0.02 to 0.10)	0.004	0.06 (0.01 to 0.11)	0.022	0.03 (-0.01 to 0.08)	0.15	0.02 (-0.02 to 0.07)	0.294	0.03 (0 to 0.06)	0.041
<i>College (Ref: No)</i>												
Yes	0.09 (0.04 to 0.13)	<0.001	0.09 (0.05 to 0.12)	<0.001	0.13 (0.09 to 0.17)	<0.001	0.11 (0.07 to 0.15)	<0.001	0.06 (0.02 to 0.09)	0.003	0.1 (0.07 to 0.14)	<0.001
<i>Insured (Ref: No)</i>												
Yes	0.01 (-0.06 to 0.07)	0.82	-0.01 (-0.06 to 0.04)	0.682	-0.03 (-0.10 to 0.04)	0.441	-0.01 (-0.08 to 0.05)	0.723	-0.06 (-0.13 to 0.02)	0.124	-0.04 (-0.1 to 0.03)	0.269

(Continues)

Model 3	\$15,000 to \$24,999		\$25,000 to \$34,999		\$35,000 to \$49,999		\$50,000 to \$74,999		\$75,000 or more			
	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value	AME (95% CI)	p-value		
<i>Length of time since last routine checkup (Ref: Within past year)</i>												
Less than past 2 years	-0.05 (-0.11 to 0.02)	0.181	0.02 (-0.03 to 0.07)	0.456	0.03 (-0.05 to 0.10)	0.479	0.00 (-0.06 to 0.06)	0.997	0.02 (-0.03 to 0.07)	0.528	0.01 (-0.02 to 0.04)	0.546
2 or more years	0.00 (-0.06 to 0.06)	0.889	-0.01 (-0.06 to 0.04)	0.676	-0.02 (-0.09 to 0.04)	0.518	0.00 (-0.06 to 0.06)	0.963	0.01 (-0.05 to 0.06)	0.782	0.00 (-0.03 to 0.04)	0.824
<i>Could not see doctor because of cost (Ref: No)</i>												
Yes	0.02 (-0.02 to 0.06)	0.367	0.05 (0.00 to 0.1)	0.049	0.08 (0.03 to 0.13)	0.002	0.05 (0.01 to 0.10)	0.024	0.12 (0.07 to 0.17)	<0.001	0.04 (-0.01 to 0.09)	0.097
<i>Personal doctor or health care provider (Ref: No)</i>												
Yes	-0.03 (-0.08 to 0.03)	0.374	0.01 (-0.05 to 0.06)	0.802	-0.02 (-0.08 to 0.04)	0.435	-0.02 (-0.07 to 0.04)	0.57	-0.02 (-0.07 to 0.04)	0.574	0.00 (-0.04 to 0.04)	0.912
<i>Safe neighborhood (Ref: No)</i>												
Yes	0.02 (-0.05 to 0.08)	0.574	-0.01 (-0.08 to 0.06)	0.825	0.09 (-0.01 to 0.19)	0.066	0.10 (0.01 to 0.19)	0.023	0.13 (0.02 to 0.24)	0.017	0.06 (-0.04 to 0.16)	0.22
Depressive (Ref: No)	-0.09 (-0.14 to -0.04)	<0.001	-0.11 (-0.15 to -0.07)	<0.001	-0.12 (-0.17 to -0.07)	<0.001	-0.13 (-0.18 to -0.08)	<0.001	-0.15 (-0.19 to -0.11)	<0.001	-0.15 (-0.18 to -0.12)	<0.001
Asthma (Ref: No)	-0.07 (-0.13 to -0.02)	0.007	-0.03 (-0.08 to 0.03)	0.374	-0.09 (-0.15 to -0.03)	0.006	-0.09 (-0.15 to -0.02)	0.012	-0.06 (-0.11 to -0.01)	0.018	-0.07 (-0.10 to -0.03)	<0.001
COPD (Ref: No)	-0.13 (-0.2 to -0.06)	<0.001	-0.17 (-0.23 to -0.10)	<0.001	-0.15 (-0.24 to -0.07)	<0.001	-0.26 (-0.34 to -0.17)	<0.001	-0.23 (-0.3 to -0.16)	<0.001	-0.17 (-0.24 to -0.10)	<0.001
Cancer (Ref: No)	-0.06 (-0.13 to 0.02)	0.125	-0.16 (-0.22 to -0.10)	<0.001	-0.14 (-0.21 to -0.06)	<0.001	-0.14 (-0.2 to -0.08)	<0.001	-0.22 (-0.28 to -0.16)	<0.001	-0.15 (-0.20 to -0.11)	<0.001
Arthritis (Ref: No)	-0.06 (-0.11 to -0.02)	0.006	-0.13 (-0.17 to -0.09)	<0.001	-0.12 (-0.16 to -0.07)	<0.001	-0.15 (-0.19 to -0.11)	<0.001	-0.16 (-0.19 to -0.12)	<0.001	-0.16 (-0.18 to -0.13)	<0.001
Diabetes (Ref: No)	0.06 (0.03 to 0.09)	<0.001	0.05 (0.03 to 0.07)	<0.001	0.07 (0.04 to 0.10)	<0.001	0.12 (0.09 to 0.15)	<0.001	0.10 (0.08 to 0.12)	<0.001	0.09 (0.07 to 0.11)	<0.001

Note: Only models with adequate specification based on the link test option (`_link, p < 0.05; _hatsq = p > 0.05`) in Stata and a variance inflation factor (VIF) of less than 10 were included in the results. Abbreviations: AME, average marginal effects; CI, confidence interval.