

Economic insecurity during the COVID-19 pandemic among healthcare workers by educational attainment

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Abstract

Prior to the COVID-19 pandemic, healthcare workers with less formal education (eg, nursing assistants and home care aides) vs more formal education (eg, physicians and nurses) were more likely to experience economic insecurity, the real and/or perceived risk of financial losses. Given the unprecedented impact of COVID-19 on healthcare workers, we sought to describe economic insecurity among these workers during the pandemic. Using data from the U.S. Census Bureau's Household Pulse Survey from July 2021 to July 2023, we examined economic insecurity among healthcare workers by educational attainment. Higher proportions of healthcare workers with an associate degree or below reported difficulty paying usual expenses, food insufficiency, and being behind on rent/mortgage payments compared to healthcare workers with a bachelor's degree or higher. Accounting for other sociodemographic characteristics, higher educational attainment was associated with significantly lower odds of economic insecurity. Since the public health emergency has ended and temporary policies to support low-wage workers during the pandemic have sunsetted, targeted policies to promote economic security among financially vulnerable low-wage workers are critical to enable recruitment and retention of these essential healthcare workers.

Lay summary

Healthcare workers in jobs that require less education to enter, such as nursing assistants and home care aides, are more likely to experience economic insecurity than highly educated healthcare workers like doctors and nurses. We used national survey data to examine the relationship between education and economic security among healthcare workers during the COVID-19 pandemic, which had unprecedented impacts on the healthcare sector. We found that more education was associated with a lower likelihood of having difficulty with paying usual expenses, having enough food to eat, and making timely rent or mortgage payments. As many policies that were enacted during the pandemic to help financially vulnerable individuals have since ended, new policies to promote economic security among low-wage workers are needed to support these essential healthcare workers.

Key words: health care workforce; healthcare workers; COVID-19; educational attainment; socioeconomic factors.

Introduction

Jobs requiring less formal education (eg, nursing assistants and home care aides) are a common entry point into healthcare compared to jobs requiring more formal education (eg, physicians, nurses, and therapists) that usually require at least a bachelor's and often a master's degree or higher for entry. Differences in pay among healthcare workers reflect the differences in formal education required for entry, with high percentages of healthcare workers in jobs that require less education earning mean hourly wages that place them below the federal poverty level.^{1,2} In 2015, 13.9% of healthcare workers in jobs requiring a high school education or less lived below the federal poverty level compared to only 2.3% of healthcare workers in jobs requiring a bachelor's degree.¹ Healthcare workers in jobs requiring less formal education are also more likely to be without health insurance and rely on public assistance programs to meet their needs, such as Medicaid for health

insurance, the Supplemental Nutrition Assistance Program (SNAP) for food, and the Earned Income Tax Credit for working individuals with low to moderate income.^{1,2} In 2015, 18.1% of healthcare workers in jobs requiring a high school education or less received SNAP vs 3.9% of healthcare workers in jobs requiring a bachelor's degree.¹ Low pay and lack of benefits may contribute to economic insecurity, the real and/or perceived risk of financial losses faced by workers and households,³ and to high rates of turnover among healthcare workers in jobs requiring less formal education.⁴⁻⁷ High turnover among these essential healthcare workers not only affects workers themselves, but can also increase costs for employers and disrupt access and care delivery for patients.

The COVID-19 pandemic had unprecedented impacts on the healthcare sector. Healthcare workers faced steep employment losses at the beginning of the pandemic and the rebound following this initial drop was not experienced equally across settings.⁸ While the number of healthcare workers employed

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by hospitals, outpatient care centers, home health service providers, and physicians' offices in early 2024 had surpassed pre-pandemic numbers, employment remains below expected levels based on trends in growth prior to the pandemic.⁸ Furthermore, the number of healthcare workers employed by skilled nursing facilities and residential care facilities, settings requiring large numbers of workers with less formal education to deliver care, has not yet recovered to prepandemic levels.⁸

Despite longstanding concerns about economic insecurity among healthcare workers and its effect on stability of the workforce, no nationally representative studies on healthcare workers across all levels of educational attainment during this uneven and incomplete recovery from the pandemic are available. Prior studies on the general population found adults without a bachelor's degree were more likely to report difficulty paying bills and making rent or mortgage payments compared to adults with a bachelor's degree or higher.⁹ In addition, existing disparities in employment loss for low income, Black, and Hispanic individuals persisted or grew during the pandemic.¹⁰⁻¹³ Indicators of economic insecurity, including food insufficiency and housing insecurity, were also higher among low income, Black, and Hispanic individuals and families with children during the pandemic.¹⁴⁻¹⁸ Black and Hispanic women are disproportionately represented in healthcare jobs requiring less vs more formal education,¹⁹ suggesting that some healthcare workers may have experienced even greater risk of economic insecurity during the pandemic.

Information on economic insecurity among healthcare workers during the pandemic is critical to inform policies and programs to support the health workforce, particularly workers in low wage jobs requiring less formal education. The Household Pulse Survey (HPS), fielded by the US Census Bureau in collaboration with other federal agencies, provides an opportunity to understand economic insecurity during the pandemic among health care workers specifically, and address critical gaps in the evidence on how healthcare workers fared during the public health emergency. Therefore, our objectives were to (1) describe economic insecurity among healthcare workers and (2) examine the relationship between economic insecurity and educational attainment as a proxy for the level of formal education required for the job.

Data and methods

Data source and sample

Our study was a secondary analysis of data from the HPS, which was designed to rapidly collect and disseminate information on the social and economic impacts of the COVID-19 pandemic on American households in order to inform federal and state policy.²⁰ The HPS is a repeated cross-sectional survey in which one adult respondent per household answers questions for the household via a 20-minute online survey. We used data from June 2021 through July 2023, which corresponds to weeks 34 through 59 of the HPS. These survey weeks were selected based on availability of variables to identify respondents as healthcare workers, measure economic insecurity, and include sociodemographic characteristics associated with economic insecurity in prior research. Our sample was limited to only respondents who indicated a healthcare setting as place of current employment and who

were not missing data on economic insecurity, educational attainment, or sociodemographic characteristics.

Measures

We used three measures of economic insecurity as our primary outcomes: (1) difficulty paying usual expenses, (2) food insufficiency, and (3) housing insecurity. Difficulty paying usual expenses includes four ordered response options to the question, "In the last 7 days, how difficult has it been for your household to pay for usual household expenses, including but not limited to food, rent or mortgage, car payments, medical expenses, student loans, and so on?": not at all difficult, a little difficult, somewhat difficult, and very difficult. Food insufficiency includes four ordered response options to the question, "Getting enough food can also be a problem for some people. In the last 7 days, which of these statements best describes the food eaten in your household?": enough of the kinds of food I/we wanted to eat; enough, but not always the kinds of food I/we wanted to eat; sometimes not enough to eat; and often not enough to eat. We used being behind on mortgage or rent payments as a dichotomous indicator of housing insecurity, which was created by combining the questions "Is this household currently caught up on mortgage payments?" for respondents who were home owners and "Is this household currently caught up on rent payments?" for respondents who rent. To provide additional information related to our primary outcomes, we described responses to survey questions on difficulty with energy bills, reasons for food insufficiency, months behind on rent or mortgage, foreclosure and eviction risk, and sources used to meet spending needs (eg, regular income, credit cards or loans, borrowing from friends or family, government programs).

Our independent variable of interest was educational attainment of the respondent as a proxy for the level of formal education required for the healthcare workers' job. We categorized the response options into five groups: high school diploma or equivalent or less; some college; associate degree; bachelor's degree; or graduate, professional, or doctoral degree. We included a wide variety of covariates based on prior research on sociodemographic characteristics associated with economic insecurity, including age group, race, Hispanic ethnicity, gender identity, sexual orientation, marital status, disability status, household income, health insurance coverage, and household composition.^{14-18,21-26} We controlled for four time periods of approximately six-months based on survey weeks to account for variation over time, and state of residence to account for variation in state-level policies and programs providing economic assistance.^{25,27-31}

Analytic approach

We reported the sociodemographic characteristics and measures of economic insecurity of healthcare workers by educational attainment using balanced replicate survey weights to provide national population estimates. We reported economic insecurity outcomes stratified by four, six-month time periods across the study timeframe to describe changes over time. We used χ^2 tests to describe differences in sociodemographic characteristics and economic insecurity across levels of educational attainment. To provide additional context for the prevalence of economic insecurity among healthcare workers, we also calculated national population estimates for economic insecurity among all workers during the study timeframe.

To examine the relationship between economic insecurity and educational attainment among healthcare workers, we used a separate regression model for each economic insecurity outcome. For difficulty paying expenses and food insufficiency, we used ordered logistic regression models to account for the four-level response options to these questions in the HPS. For housing insecurity, we used a logistic regression model as the response for this question was dichotomous. All regression models used the balanced repeated replication (BRR) method with weekly survey weights to account for the HPS survey design, and controlled for covariates described previously. This study was exempt from Institutional Review Board approval because the HPS data are publicly available and respondents are not identifiable. Analyses were conducted using Stata version 16 (StataCorp, College Station, TX).

Results

Sample characteristics

There were 99 431 respondents with complete data for our analysis who reported working in healthcare, representing a weighted national population estimate of 11 899 749 healthcare workers. Of these healthcare workers, 17.2% had a high school diploma or equivalent or less; 17.0% had some college; 16.1% had an associate degree, 22.1% had a bachelor's degree, and 27.7% had a graduate, professional, or doctoral degree. [Table 1](#) displays healthcare workers' sociodemographic characteristics by educational attainment. Healthcare workers who are Black, Hispanic, female, have difficulty with mobility, remembering, and seeing, or have low income are disproportionately represented in the lower educational attainment groups.

Prevalence of economic insecurity among healthcare workers

[Table 2](#) presents weighted estimates of economic insecurity among healthcare workers overall and by educational attainment across the study timeframe. Economic insecurity was common and was more prevalent among healthcare workers with lower vs higher educational attainment. While 61.8% of all healthcare workers experienced at least some difficulty paying usual expenses, there was significant variation by educational attainment. The percent of healthcare workers with some college or less experiencing at least some difficulty paying usual expenses was around twice as high in the first two time periods and three times as high in the last two time periods compared to healthcare workers with a graduate, professional, or doctoral degree. Higher percentages of healthcare workers with low educational attainment also reported greater levels of difficulty with additional survey questions related to paying usual expenses (see [Table S1](#)). Energy bills were difficult to pay at least some of the time for 22.2% of all healthcare workers, including over a third of workers with some college or less. Nearly one half of workers with some college or less reported forgoing or reducing expenses for basic household necessities like food or medicine in order to pay their energy bills, and about a quarter reported keeping their homes at unsafe or unhealthy temperatures.

At least some level of food insufficiency was experienced by 36.2% of all healthcare workers. Similar to difficulty paying expenses, food insufficiency was significantly more common in households with healthcare workers with lower vs higher educational attainment across each time period. The percent

of healthcare workers experiencing food insufficiency increased over the first three time periods regardless of educational attainment. Among healthcare workers who experienced food insufficiency, 22.7% reported they could not afford to buy more food; in households with children, 27.4% reported their children sometimes or often did not eat enough due to inability to afford food (see [Table S1](#)).

Housing insecurity was the least commonly experienced measure of economic insecurity with 6.6% of healthcare workers overall behind on rent or mortgage payments. Housing insecurity was significantly more common among healthcare workers with lower vs higher educational attainment. There was no consistent pattern of housing insecurity over time across levels of educational attainment. Risk of eviction was almost double among healthcare workers with an associate degree or less compared to those with a bachelor's degree or higher (see [Table S1](#)).

Healthcare workers used a variety of sources to meet their spending needs (see [Table S1](#)), including regular income (90.2%), credit cards or loans (43.8%), savings or selling assets (27.9%), borrowing from friends or family (10.6%), deferred or forgiven debts (4.5%), SNAP (4.8%), school meal assistance (3.9%), and governmental rental assistance (0.8%). As educational attainment increased, a greater percentage of healthcare workers reported using regular income and deferred or forgiven debts to meet spending needs, and a lower percentage reported borrowing from friends or family and using government assistance for rent or meals through SNAP or school meal benefits. Use of credit cards or loans and saving or selling assets to meet spending needs was more common among healthcare workers with some college, an associate degree, or a bachelor's degrees compared to those with a high school diploma or equivalent or less or a graduate, professional, or doctoral degree.

Similar patterns of economic insecurity by educational attainment were observed among all workers as were seen among healthcare workers (see [Table S2](#)). While 61.4% of all workers experienced at least some difficulty paying usual expenses, the percent of workers with some college or less education experiencing difficulty was about double that of workers with bachelor's degrees or higher. Nearly half of workers with some college or less experienced food insufficiency compared to only a quarter of workers with a bachelor's degree. The percent of workers reporting being behind on rent or mortgage payments decreased as educational attainment increased.

Association between educational attainment and economic insecurity among healthcare workers

[Table 3](#) presents the estimates from our regression models examining relationships between economic insecurity and educational attainment, adjusted for all other covariates. In general, as educational attainment increased, healthcare workers had significantly lower odds of reporting difficulty paying usual expenses, food insufficiency, or housing insecurity based on rent/mortgage payments. For example, compared to healthcare workers with a high school diploma or equivalent or less, healthcare workers with a graduate, professional, or doctoral degree and otherwise similar sociodemographic characteristics had 40% lower odds of having at least some difficulty in paying usual expenses vs no difficulty (or having a somewhat or very difficult time vs no difficulty or a little

Table 1. Sociodemographic characteristics of healthcare workers by educational attainment.

	High school graduate or equivalent or less Col % (SE)	Some college Col % (SE)	Associate degree Col % (SE)	Bachelor's degree Col % (SE)	Graduate, professional, or doctoral degree Col % (SE)
Age ^a					
18-24	6.3 (0.7)	3.8 (0.3)	0.3 (0.1)	6.3 (0.7)	3.8 (0.3)
25-34	18.7 (0.8)	25.5 (0.6)	24.4 (0.3)	18.7 (0.8)	25.5 (0.6)
35-44	21.7 (0.8)	25.1 (0.5)	28.9 (0.3)	21.7 (0.8)	25.1 (0.5)
45-54	21.4 (0.8)	21.3 (0.4)	21.2 (0.3)	21.4 (0.8)	21.3 (0.4)
55-64	21.4 (0.8)	17.3 (0.5)	16.2 (0.3)	21.4 (0.8)	17.3 (0.5)
65-74	9.1 (0.6)	6.7 (0.3)	7.8 (0.2)	9.1 (0.6)	6.7 (0.3)
75+	1.4 (0.3)	0.4 (0.0)	1.3 (0.1)	1.4 (0.3)	0.4 (0.0)
Race ^a					
White only	69.8 (1.0)	72.2 (0.7)	77.5 (0.7)	74.9 (0.4)	74.4 (0.4)
Black only	20.5 (0.8)	17.3 (0.6)	12.7 (0.5)	10.2 (0.4)	9.2 (0.3)
Asian only	3.1 (0.4)	3.7 (0.3)	3.9 (0.4)	10.0 (0.4)	12.1 (0.3)
Other race or multi-race	6.7 (0.6)	6.7 (0.4)	5.9 (0.4)	4.9 (0.2)	4.3 (0.2)
Hispanic, Latino or Spanish origin ^a					
Yes	20.5 (1.1)	17.0 (0.7)	13.0 (0.6)	9.8 (0.4)	8.2 (0.3)
Marital status ^a					
Married now	48.0 (1.0)	45.9 (0.7)	57.1 (0.7)	59.6 (0.5)	71.1 (0.4)
Widowed	3.8 (0.4)	3.0 (0.2)	2.4 (0.2)	1.7 (0.1)	1.2 (0.1)
Divorced	15.9 (0.7)	13.7 (0.4)	15.2 (0.4)	9.4 (0.2)	8.5 (0.2)
Separated	3.9 (0.4)	3.0 (0.2)	2.4 (0.2)	1.1 (0.1)	0.9 (0.1)
Never married	28.4 (1.1)	34.5 (0.7)	23.0 (0.6)	28.1 (0.5)	18.3 (0.4)
Gender identity ^a					
Male	26.0 (1.3)	26.2 (0.7)	20.1 (0.5)	24.8 (0.4)	36.1 (0.4)
Female	71.8 (1.3)	71.6 (0.7)	78.7 (0.6)	74.0 (0.4)	63.0 (0.4)
Transgender	0.5 (0.2)	0.9 (0.2)	0.4 (0.1)	0.4 (0.1)	0.3 (0.0)
None of these	1.6 (0.3)	1.2 (0.1)	0.8 (0.1)	0.8 (0.1)	0.7 (0.1)
Cisgender ^a					
Yes	97.6 (0.4)	97.5 (0.2)	98.7 (0.2)	98.6 (0.1)	98.9 (0.1)
Sexual orientation ^a					
Straight	88.9 (0.6)	83.6 (0.6)	88.7 (0.4)	87.3 (0.4)	89.5 (0.3)
Not straight	11.1 (0.6)	16.4 (0.6)	11.3 (0.4)	12.7 (0.4)	10.5 (0.3)
Gay or lesbian	3.0 (0.4)	4.3 (0.3)	3.2 (0.3)	4.1 (0.3)	4.4 (0.2)
Bisexual	5.0 (0.4)	8.3 (0.3)	5.9 (0.3)	5.8 (0.3)	4.0 (0.2)
Something else	1.3 (0.2)	2.6 (0.3)	1.2 (0.2)	1.8 (0.1)	1.4 (0.1)
I don't know	1.7 (0.3)	1.3 (0.2)	1.1 (0.1)	1.0 (0.1)	0.8 (0.1)
Limitations in mobility ^a					
No difficulty	72.6 (1.0)	78.9 (0.5)	81.4 (0.4)	88.9 (0.3)	90.8 (0.2)
Some difficulty	22.7 (0.9)	18.2 (0.5)	16.5 (0.4)	9.9 (0.3)	8.2 (0.2)
A lot of difficulty	4.4 (0.4)	2.6 (0.2)	2.0 (0.2)	1.1 (0.1)	0.9 (0.1)
Cannot do it all	0.3 (0.1)	0.2 (0.1)	0.1 (0.0)	0.0 (0.0)	0.1 (0.0)
Limitations in remembering ^a					
No difficulty	54.3 (1.1)	50.0 (0.7)	55.5 (0.6)	62.2 (0.4)	72.2 (0.3)
Some difficulty	38.6 (1.1)	40.6 (0.6)	38.3 (0.7)	33.0 (0.4)	24.8 (0.3)
A lot of difficulty	6.8 (0.5)	9.1 (0.4)	6.2 (0.3)	4.8 (0.2)	2.9 (0.1)
Cannot do it all	0.3 (0.1)	0.3 (0.1)	0.0 (0.0)	0.0 (0.0)	0.1 (0.0)
Limitations in seeing ^a					
No difficulty	58.8 (1.1)	60.3 (0.8)	65.0 (0.7)	72.2 (0.4)	77.2 (0.3)
Some difficulty	34.8 (1.0)	35.2 (0.7)	31.1 (0.7)	25.4 (0.4)	20.8 (0.3)
A lot of difficulty	6.0 (0.6)	4.3 (0.3)	3.8 (0.2)	2.4 (0.2)	1.8 (0.1)
Cannot do it all	0.4 (0.1)	0.3 (0.1)	0.1 (0.0)	0.1 (0.0)	0.2 (0.0)
Limitations in hearing ^a					
No difficulty	85.0 (0.7)	85.6 (0.5)	86.7 (0.5)	89.6 (0.3)	90.3 (0.2)
Some difficulty	12.0 (0.6)	12.4 (0.5)	11.8 (0.4)	9.4 (0.2)	8.7 (0.2)
A lot of difficulty	2.0 (0.3)	1.6 (0.1)	1.2 (0.1)	0.8 (0.1)	0.9 (0.1)
Cannot do it all	1.1 (0.3)	0.4 (0.1)	0.3 (0.1)	0.1 (0.0)	0.1 (0.0)
Any sensory disability ^a					
Yes	46.1 (1.1)	44.9 (0.8)	40.2 (0.7)	32.4 (0.4)	27.6 (0.3)
Number of adults in household ^a					
1-2 adults	53.5 (1.2)	55.9 (0.7)	60.2 (0.8)	64.4 (0.6)	71.5 (0.4)
3-5 adults	42.9 (1.1)	41.2 (0.7)	37.7 (0.7)	33.5 (0.5)	27.4 (0.4)
6 or more adults	3.6 (0.5)	2.8 (0.4)	2.0 (0.3)	2.1 (0.3)	1.1 (0.1)
Number of kids in household ^a					
No kids	57.1 (1.0)	57.4 (0.7)	53.6 (0.7)	59.5 (0.6)	55.7 (0.4)
1 to 3 kids	39.7 (1.1)	39.4 (0.7)	43.5 (0.6)	38.6 (0.5)	41.9 (0.4)
4 or more kids	3.2 (0.3)	3.2 (0.3)	2.8 (0.2)	1.9 (0.1)	2.5 (0.1)

(continued)

Table 1. Continued

	High school graduate or equivalent or less Col % (SE)	Some college Col % (SE)	Associate degree Col % (SE)	Bachelor's degree Col % (SE)	Graduate, professional, or doctoral degree Col % (SE)
Any health insurance ^a					
Yes	91.4 (0.6)	93.9 (0.4)	95.7 (0.2)	97.7 (0.1)	98.4 (0.1)
Medicaid or government medical assistance of any kind ^a					
Yes	28.3 (0.8)	19.7 (0.6)	12.6 (0.5)	6.4 (0.3)	3.4 (0.1)
Income ^a					
<\$25k	17.2 (0.7)	9.4 (0.4)	5.5 (0.4)	3.0 (0.2)	1.5 (0.1)
\$25-34k	19.6 (0.8)	14.7 (0.5)	8.5 (0.4)	4.4 (0.2)	1.3 (0.1)
\$35-49k	19.3 (0.7)	17.7 (0.5)	12.9 (0.5)	6.7 (0.2)	3.5 (0.2)
\$50-74k	20.3 (0.9)	22.3 (0.7)	21.6 (0.6)	15.3 (0.3)	9.1 (0.2)
\$75-99k	10.7 (0.5)	14.6 (0.5)	19.9 (0.6)	18.3 (0.4)	10.8 (0.2)
\$100-149k	8.9 (0.5)	13.9 (0.5)	21.4 (0.5)	27.4 (0.5)	23.0 (0.3)
\$150-199k	2.4 (0.3)	4.7 (0.2)	6.9 (0.3)	13.5 (0.3)	16.5 (0.3)
\$200k+	1.6 (0.3)	2.7 (0.2)	3.3 (0.2)	11.3 (0.3)	34.4 (0.4)

Data are presented as column percent (standard error) estimated using BRR. Percent represents weighted estimate for healthcare workers nationally. 99 431 respondents reported working in healthcare representing a weighted national population estimate of 11 899 749 healthcare workers.

Source: Authors' analysis of HPS data from the US Census Bureau for June 2021-July 2023.

^aP < .001 for χ^2 test comparing sociodemographic characteristics across levels of educational attainment.

difficulty). However, compared to healthcare workers with a high school diploma equivalent or less, there was no significant difference between healthcare workers with some college for all three economic insecurity measures and for healthcare workers with an associate degree and being behind on rent/mortgage payments. See Table S3 for estimates for covariates included in the models.

Figure 1 shows the predicted margins from our regression models which represent the estimated probability of each level of the economic insecurity outcomes by educational attainment. For example, as educational attainment increases, the probability of experiencing no difficulty paying usual expenses increases while the probability of experiencing a somewhat or very difficult time paying usual expenses decreases proportionally. Similarly, as educational attainment increases, the probability of having enough of the kinds of food that are wanted increases while the probability of having enough food, but not always the kinds of food wanted and sometimes not having enough to eat decreases. The probability of being behind on rent/mortgage payments decreases as educational attainment increases.

Discussion

Using nationally representative data from the HPS, we found that economic insecurity was common among healthcare workers during the COVID-19 pandemic and generally increased over time. The likelihood of experiencing difficulty paying usual expenses, food insufficiency, and housing insecurity was greater for healthcare workers with lower vs higher educational attainment. Healthcare workers with lower educational attainment were also more likely to use public programs, including SNAP, school meal benefits, and rental assistance. While we cannot definitively connect lower educational attainment with jobs requiring less formal education in our sample based on design of HPS, our findings suggest healthcare workers in positions requiring less vs more formal education face greater economic insecurity.

Our findings are consistent with research on healthcare workers prior to the pandemic that found higher financial

risk and higher use of state and federal assistance programs among healthcare workers whose occupations had lower vs higher education requirements for entry.¹ Comparing use of specific public programs prior to the pandemic from a study using the 2015 Current Population Survey, we found lower use of SNAP among healthcare workers with a high school diploma or less; higher use of SNAP among those with an associate degree; and approximately 10 percentage point higher use of Medicaid among healthcare workers with an associate degree, some college, or high school or less,¹ which is consistent with higher Medicaid enrollment during the pandemic among the entire population. Our findings also align with the 2022 Current Population Survey study, which found high poverty levels and use of public assistance among direct care workers requiring less formal education.² That study found 15% of home care workers and 12% of nursing assistants living below the federal poverty level, and 58% of home care workers and 39% of nursing assistants receiving some public assistance (eg, Medicaid, SNAP, and cash assistance).² Together, these findings suggest the continued importance of public programs for low-wage healthcare workers.

While the relationship between economic insecurity and educational attainment was similar across the three outcome measures we used in our study, variation in the proportion of healthcare workers experiencing difficulty paying usual expenses, food insufficiency, and making timely rent or mortgage payments supports the need to use multiple measures when assessing economic insecurity and developing targeted policies and programs. In addition, our results on the relationships between economic insecurity and other sociodemographic characteristics of healthcare workers (see Table S3) were generally consistent with prior research that found individuals who are Black, Hispanic, not cisgender, low income, have disabilities, and have larger households with more children are more likely to experience economic insecurity.^{14-18,21-26} Policies and programs are needed that target populations with multiple risk factors for economic insecurity to ensure that the most financially vulnerable groups are able to access public supports. Future research that examines economic insecurity among healthcare workers based on multiple, intersecting risk factors is

Table 2. Economic insecurity among healthcare workers by educational attainment.

Time period and educational attainment	Difficulty paying usual household expenses in the last 7 days ^b				Household food sufficiency in the last 7 days ^a				Behind on rent or mortgage payments ^a								
	Not at all difficult		A little difficult		Somewhat difficult		Very difficult		Enough of the kinds of food (I/we) wanted to eat		Enough, but not always the kinds of food (I/we) wanted to eat		Sometimes not enough to eat		Often not enough to eat		
	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)	Row % (SE)
07/21/21-12/13/21																	
HS grad or lower	34.5 (1.9)	32.2 (2.2)	20.1 (2.2)	13.1 (1.8)	60.8 (2.5)	27.6 (2.4)	8.4 (1.6)	3.2 (0.9)	8.6 (1.2)								
Some college	34.5 (1.9)	31.7 (1.7)	19.7 (1.3)	14.1 (1.2)	62.3 (1.8)	27.7 (1.7)	7.6 (0.8)	2.5 (0.6)	9.4 (0.9)								
Associate degree	46.0 (1.2)	28.6 (1.2)	17.5 (1.2)	7.9 (0.7)	71.5 (1.3)	22.3 (1.2)	5.1 (0.6)	1.1 (0.3)	9.1 (1.1)								
Bachelor's degree	59.7 (1.2)	24.2 (1.1)	11.7 (0.7)	4.5 (0.5)	82.5 (0.8)	14.5 (0.7)	2.5 (0.3)	0.6 (0.2)	4.7 (0.5)								
Grad/prof/doctoral	71.6 (0.8)	18.2 (0.8)	7.0 (0.4)	3.2 (0.4)	90.7 (0.6)	7.8 (0.6)	1.1 (0.2)	0.4 (0.1)	2.8 (0.3)								
12/29/21-06/13/22																	
HS grad or lower	28.8 (2.5)	28.9 (1.9)	21.1 (1.9)	21.2 (2.2)	53.9 (2.6)	31.8 (2.0)	12.6 (1.4)	1.7 (0.4)	9.5 (1.3)								
Some college	23.7 (1.9)	29.8 (1.8)	25.2 (1.5)	21.3 (1.5)	50.8 (1.8)	35.3 (1.9)	9.7 (1.0)	4.2 (0.9)	10.9 (1.1)								
Associate degree	36.1 (1.7)	31.2 (1.4)	19.9 (1.1)	12.9 (1.2)	63.4 (1.5)	27.7 (1.4)	7.7 (0.9)	1.2 (0.3)	9.3 (1.0)								
Bachelor's degree	49.9 (1.2)	28.5 (0.9)	15.5 (0.9)	6.0 (0.5)	77.5 (1.0)	19.8 (1.0)	2.4 (0.4)	0.3 (0.1)	4.0 (0.4)								
Grad/prof/doctoral	64.4 (0.9)	21.1 (0.7)	10.9 (0.6)	3.6 (0.3)	85.5 (0.7)	13.2 (0.7)	0.9 (0.3)	0.4 (0.1)	2.8 (0.3)								
06/29/22-12/19/22																	
HS grad or lower	12.9 (1.5)	27.9 (1.6)	28.0 (1.7)	31.2 (2.1)	35.6 (2.3)	43.8 (2.3)	17.5 (1.5)	3.0 (0.8)	13.8 (1.4)								
Some college	16.4 (1.0)	31.1 (1.3)	27.8 (1.4)	24.7 (1.2)	41.9 (1.2)	40.8 (1.4)	13.9 (1.2)	3.4 (0.6)	9.8 (0.8)								
Associate degree	22.8 (1.1)	33.8 (1.6)	25.2 (1.5)	18.2 (1.2)	50.7 (1.3)	38.7 (1.3)	8.1 (1.0)	2.5 (0.4)	6.9 (0.7)								
Bachelor's degree	38.4 (1.1)	33.5 (0.8)	17.9 (0.9)	10.3 (0.8)	66.7 (1.2)	29.2 (1.0)	3.5 (0.5)	0.6 (0.2)	4.9 (0.6)								
Grad/prof/doctoral	55.2 (0.8)	26.5 (0.7)	12.2 (0.6)	6.1 (0.5)	78.7 (0.8)	19.0 (0.7)	1.6 (0.2)	0.7 (0.2)	2.9 (0.3)								
01/04/23-07/10/23																	
HS grad or lower	15.3 (1.2)	32.1 (1.7)	26.2 (1.2)	26.4 (1.6)	41.4 (1.6)	39.1 (1.4)	14.8 (1.2)	4.7 (0.6)	10.9 (1.7)								
Some college	18.6 (0.9)	31.8 (1.0)	25.7 (0.9)	23.9 (1.0)	44.1 (1.0)	41.0 (1.1)	12.1 (0.7)	2.7 (0.3)	9.9 (0.7)								
Associate degree	24.0 (0.8)	33.3 (0.9)	26.2 (1.0)	16.5 (0.7)	51.8 (1.0)	38.9 (1.0)	7.6 (0.6)	1.7 (0.2)	6.9 (0.5)								
Bachelor's degree	37.6 (0.7)	33.5 (0.6)	19.2 (0.6)	9.7 (0.4)	68.3 (0.7)	27.6 (0.7)	3.5 (0.3)	0.6 (0.1)	4.1 (0.4)								
Grad/prof/doctoral	55.3 (0.6)	27.0 (0.5)	11.9 (0.4)	5.7 (0.3)	80.0 (0.4)	18.0 (0.4)	1.5 (0.2)	0.5 (0.1)	2.3 (0.2)								
Total	38.2 (0.3)	29.2 (0.3)	19.0 (0.2)	13.6 (0.2)	63.8 (0.3)	27.9 (0.3)	6.6 (0.2)	1.7 (0.1)	6.6 (0.2)								

Data are presented as row percent (standard error) estimated using BRR. Percent represents weighted estimate for 11 899 749 healthcare workers nationally based on survey responses from 99 431 healthcare workers. Source: Authors' analysis of HPS data from the US Census Bureau for June 2021-July 2023.

^aP < .001 for χ^2 test comparing measures of economic insecurity across levels of educational attainment within each time period.

Table 3. Estimated association between economic insecurity and educational attainment among healthcare workers.

Educational attainment	Ordered logistic regression estimates		Logistic regression estimates
	Expense difficulty Proportional odds (SE)	Food insufficiency Proportional odds (SE)	Housing insecurity Odds ratio (SE)
High school graduate or equivalent or less (ref)	1.0	1.0	1.0
Some college	1.10 (0.06)	1.05 (0.06)	1.09 (0.11)
Associate degree	0.90 ^a (0.05)	0.88 ^b (0.04)	1.08 (0.11)
Bachelor's degree	0.71 ^c (0.04)	0.66 ^c (0.03)	0.86 (0.08)
Graduate, professional, or doctoral degree	0.60 ^c (0.03)	0.57 ^c (0.03)	0.77 ^b (0.07)

All models used BRR to account for survey design. Estimates are adjusted for age group, race, Hispanic ethnicity, gender identity, sexual orientation, marital status, disability status, household income, health insurance coverage, household composition, state of residence, and time period.

Source: Authors' analysis of HPS data from the US Census Bureau for June 2021-July 2023.

^a $P < .05$; ^b $P < .01$; ^c $P < .001$.

warranted to guide targeting of programs to those who are especially financially vulnerable and ensure access to programs for those who are eligible to receive support.³²

Though not targeted toward healthcare workers, existing federal and state programs as well as programs that were expanded or initiated during the pandemic under the public health emergency have played an important role in addressing economic insecurity. While examining the impacts of specific policies and programs on economic insecurity among healthcare workers was beyond the scope of our study, prior research provides evidence on the success of key federal and state programs in mitigating economic insecurity among the general population. Since the prevalence of economic insecurity among healthcare workers was similar to that of all workers in our study, we expect these policies and programs also benefitted healthcare workers. Several studies evaluated the impact of the enhanced Child Tax Credit (CTC) and advanced CTC payments from the American Rescue Plan Act of 2021; these studies found that temporary changes to this federal benefit reduced food insufficiency in households with children and when the enhanced CTC and advanced payments were discontinued, household food insufficiency increased, especially among lower income households.³³⁻³⁶ The increase in household food insufficiency following the expiration of the enhanced CTC in January 2022 in these studies tracks with our findings of an increasing percent of healthcare workers reporting food insufficiency in time periods in 2022 compared to 2021. However, even when the enhanced CTC was available, not every household that was eligible received it, suggesting a need to address the gap between policy enactment and implementation if efforts to bring back an enhanced CTC eventually prove successful.³²

Other temporary measures at the federal level, including federal economic stimulus payments and extra unemployment compensation in the early stages of the pandemic were also associated with lower risk of missing rent or mortgage payments, decreased food insecurity, and mitigation of psychological distress associated with food insecurity.³⁷⁻³⁹ Higher percentages of adults without a bachelor's degree reported they would use federal stimulus payments to pay bills or for essential needs compared to adults with a bachelor's degree or higher,⁴⁰ so the increases we observed in the percent of healthcare workers with lower educational attainment having difficulty paying for usual household expenses over time may be partially explained by end of these direct payments. Multiple studies have examined the importance of state policies and programs, including Medicaid expansion and continuous enrollment, enhancements of SNAP benefits, eviction and foreclosure

moratoria, minimum wage increases, temporary paid leave expansion, and unemployment benefit expansion, in mitigating economic insecurity for low income households.^{27-31,41-43}

Yet despite the promise of both longstanding programs and temporary measures enacted during the pandemic to support financially vulnerable households, our study found that economic insecurity remained widespread during the pandemic and increased over time among healthcare workers, especially those with lower educational attainment. Economic insecurity among healthcare workers in jobs requiring less formal education is particularly concerning because recruitment and retention for these roles is already challenging and demand for these workers has outpaced growth for decades and continues to grow.^{44,45} Continuation of policies and programs, such as the enhanced CTC and continuous Medicaid enrollment, that are aimed at all low income households would likely benefit healthcare workers in jobs requiring less formal education. In addition, policies that improve wages for healthcare workers in jobs requiring less formal education may reduce economic insecurity among these workers. Policies that may increase pay for low-wage healthcare workers include raising state minimum wages overall, providing increased minimum wage add-ons for healthcare workers specifically, guaranteeing consistent hours and benefits, and increasing Medicaid funding for long-term care via pass-through payments, which allocate increases in reimbursement that must be directed toward compensation of home care workers and nursing assistants.^{46,47} The success of state-level efforts using these strategies to improve wages for healthcare workers have been mixed, with stakeholders reporting that while wages have increased, they remained too low to recruit and retain a large enough workforce to meet demand, especially given increased competition for low-wage workers from other industries.^{46,47} Addressing this issue will require additional intervention from federal and state policymakers and employers to reduce economic insecurity among healthcare workers in jobs requiring less formal education to promote recruitment and retention of this essential workforce.

Our study has several limitations. First, as with any survey, HPS data are self-reported and thus subject to response and recall bias as well as missingness at the question-level. Second, the repeated cross-sectional nature of the HPS prohibits longitudinal examination of economic security among households. Third, since the HPS was designed for rapid deployment and was adapted over time to reflect emergent issues (eg, vaccine availability and uptake, inflation), we could not use all waves of data for our study due to lack of availability and consistency of variables of interest across the entire HPS timeframe.

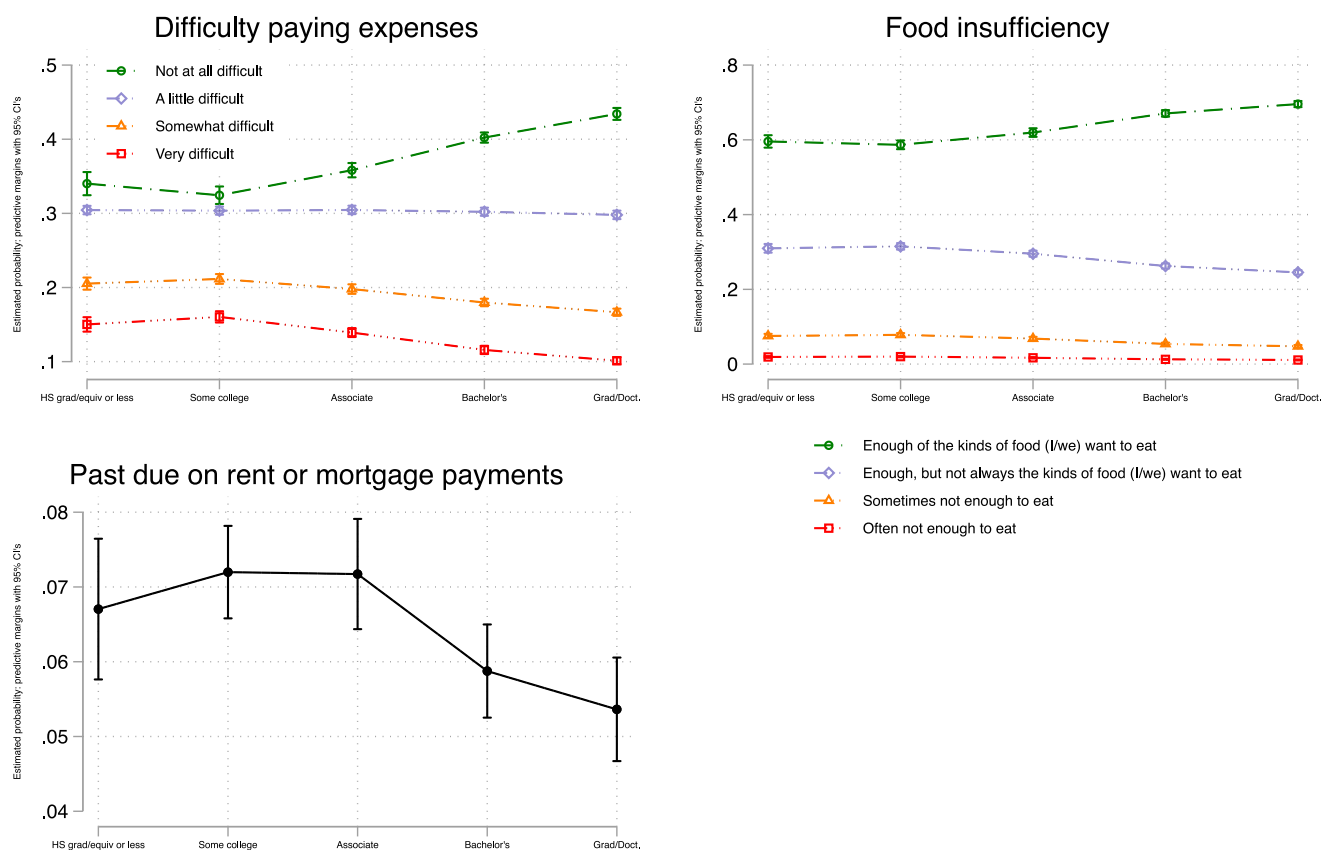


Figure 1. Predicted probability of levels of economic insecurity among healthcare workers by educational attainment. Notes: Estimated probabilities of each level of the outcomes are from the predicted margins of ordered logistic regression models for difficulty paying usual expenses and food insufficiency and of a logistic regression model for behind in rent/mortgage payments. All models included balanced replicate weights to account for survey design. Estimates are adjusted for age group, race, Hispanic ethnicity, gender identity, sexual orientation, marital status, disability status, household income, health insurance coverage, household composition, state of residence, and time period. Source: Authors' analysis of HPS data from the US Census Bureau for June 2021-July 2023.

Fourth, the survey questions we used as measures of economic insecurity do not fully capture all factors that contribute to real and/or perceived risk of financial loss. Fifth, our identification of healthcare workers based on employment at a health care setting does not differentiate between clinical and non-clinical jobs. Sixth, the survey design of the HPS only allows for identification of healthcare workers who are employed at the time of the survey, so our results do not include data from unemployed healthcare workers who may be at even higher risk for economic insecurity due to job loss. Finally, the HPS is designed to provide information on households based on responses from one adult household member, so while we controlled for the number of adults in the household and household income, we could not account for any healthcare workers in the household who were not the respondent. Despite these limitations, the HPS enables us to provide the first nationally representative information on economic security among healthcare workers during the COVID-19 pandemic.

Conclusion

Data from the HPS revealed economic insecurity was common among healthcare workers during the COVID-19 pandemic. Healthcare workers with an associate degree or below were more likely to experience difficulty paying usual expenses,

food insufficiency, and inability to make timely rent/mortgage payments compared to healthcare workers with a bachelor's degree or higher. Despite federal and state programs to support low income households during the pandemic, economic insecurity remained widespread among healthcare workers with low educational attainment. Now that the public health emergency has ended and temporary measures to support low income households during the pandemic have sunsetted, targeted policies and programs to promote economic security among financially vulnerable healthcare workers are critical to enable recruitment and retention of these essential healthcare workers.

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

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Conflicts of interest

Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Data Availability

Household Pulse Survey Public Use Files and related metadata are freely available and downloadable from <https://www.census.gov/programs-surveys/household-pulse-survey/data/datasets.html>.

Notes

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