



The Impact of Health Coverage, Race and Ethnicity on Utilization of Preventive Medical Care during the First Year of the Covid-19 Pandemic: Findings from the National Health Interview Survey 2019–2020

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Abstract

Objectives This study examined COVID-19's impact in the 2020 compared to 2019 survey years on preventive medical care utilization.

Research Design Using a cross-sectional sample of adults aged 18 years and over (2019; $n = 31,997$; 2020; $n = 31,568$), from the National Health Interview Survey, multivariable models compared 2020 to 2019 survey years for receiving diabetes screening blood tests, well-care visits, and physical therapy. An additional multivariable model predicted not having medical care due to the COVID-19 pandemic in the 2020 survey year.

Results In the 2020 versus 2019 survey years, the likelihood lowered for receiving a blood test for diabetes screening (aOR .83 CI = .76, .90). There was a lowered likelihood for a well care visits (aOR = .98 CI = .84, 1.1) and physical therapy (aOR = .97 CI = .89, 1.0). Black (aOR = .62 CI = .51, .75), Hispanic (aOR = .62 CI = .51, .75) and Asian (aOR .67 CI = .53, .86) adults had a lowered likelihood of having physical therapy compared to White adults. Having no insurance coverage lowered the likelihood of getting all three indicators of preventive medical care. There was a higher likelihood of not getting medical care due to COVID-19 in the 2020 survey year (aOR = 1.7 CI = 1.3, 2.1) with Medicaid compared to private coverage.

Conclusions Use of preventive medical care lowered in the pandemic. Race and ethnicity and not having any coverage contributed to not receiving preventive care. Medicaid appeared to increase utilization of preventive medical care but not acute medical care.

Keywords Medical care utilization · Preventive medical care · Health coverage · COVID-19 pandemic · Health disparities · Health coverage disparities

Introduction

In the US, COVID-19 emerged as a public health crisis in late 2019 and was officially recognized as a pandemic in early March 2020 [5]. Awareness of COVID-19 grew as case numbers rose sharply, and symptomology of fever, malaise, dry cough, and dyspnea rose at alarming rates [10]. Whole-genome sequencing showed that the causative agent was a novel coronavirus [10]. The COVID-19 pandemic resulted in a national lockdown, dramatically altering all aspects of Americans' lives [3]. Rising death and case numbers led to

closures of workplaces, schools, and recreational centers, which negatively affected economic and social well-being [3]. The delivery of health care was also adversely affected, with outpatient medical facilities suspending routine patient care, and hospitals heroically dedicating themselves to the treatment of COVID-19 [18]. In a striking example, the pandemic caused a significant decrease in cardiac surgeries, a loss of hospital revenues, and a backlog of surgical needs [2].

The lockdown disengaged patients from their healthcare routines [3]. Telehealth offered some relief, but required health insurance coverage [12]. Also, in-person clinical procedures such as blood draws and physical therapy (PT) that involved physical contact with the patient were compromised [12]. Relief from the lockdown slowly arrived when

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the vaccines proved effective against severe disease and death from COVID-19 [4]. Vaccination against COVID-19 started in December 2020, however, progress of immunizing the public proceeded at a less-than-optimal rate, resulting in the delay of normalcy in outpatient medical care [4]. Final release from lockdowns occurred nationwide from April through August 2021 [3].

COVID-19 has caused the deaths of over one million Americans since 2020 [11]. The number is likely an underestimate because of limited early recognition, and the slow start in developing diagnostic tests. The monetary cost of human life loss, based on models from the influenza pandemic, are estimated at 500 billion US dollars—or 0.6% of global income—per year [7]. However, future COVID-related loss of life since the pandemic remains unknown because no studies to date have documented a higher risk of not having routine preventive medical care during 2020. Forgoing preventive medical care during this time undoubtedly prevented the early detection of chronic health conditions.

Early detection of diabetes can reverse or moderate blood glucose levels with behavioral and dietary changes, preventing the transition from pre-diabetes to full diabetes and bodily damage from elevated glucose levels [26]. Similarly, lack of well care visits precludes the detection of preventable chronic health conditions, and not using PT can increase disability from orthopedic and neurological disorders such as stroke and Parkinson's disease [21]. This study examined preventive medical care using three indicators of medical care for disease prevention: 1 not having a blood test for diabetes screening, 2 not having a well care visit with a doctor; and 3 not having PT. We made these assessments by comparing the use of preventive procedures in 2020 to 2019. The goal of this cross-sectional study was to use the National Health Interview Survey (NHIS, the largest US dataset dedicated to examining health, to quantify the risk of not receiving any one of these three indicators of preventive medical care in 2020 compared to 2019, the last pre-pandemic year [3].

A second study goal was to examine whether health coverage type, including no coverage, Medicaid, Medicare, private coverage, and private coverage combined with Medicare impacted utilization of medical care in 2020. Our hypothesis was that adults without private insurance a higher likelihood of not getting medical care due to the COVID-19 pandemic compared to those with private coverage during the COVID-19 pandemic. We further hypothesized that because non-Hispanic Black and Hispanic adults were more likely to have Medicaid or no coverage compared to White adults, they were at higher risk of not getting medical care because of the COVID-19 pandemic.

Methods

Analytic Sample and Data Source

Our sample included adults from the 2019 and 2020 NHIS aged ≥ 18 years ($n = 63,565$) representing 502,968,616 adults nationwide. Respondents were interviewed once in a survey year and were not interviewed again. The survey year 2019 was the year immediately before the COVID-19 pandemic. Our data measured the impact of COVID-19 on health care utilization after the nation-wide shut down and reflects individual shut-ins, the closing of outpatient offices, and the dedication of hospitals to the critically ill. Testing for COVID-19 was not available in the early months of 2020, and numbers of COVID-19 positive cases likely underrepresents the numbers infected in 2020 [14].

Measures

Sociodemographic Characteristics

The NHIS is conducted by Center for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) typically through home-based interviews using clustered sampling techniques to select dwelling units. Due to the COVID-19 pandemic the 2020 data collection effort was modified to consist of four separate designs: primarily in-person (Q1); telephone only (Q2); telephone attempts first with some in-person where feasible (Q3 & Q4) [19]. It used a multistage probability sample with stratification and oversampling of some subpopulations. The NHIS is the principal data source for tracking the health of the US civilian noninstitutionalized population [20]. We report both unweighted and weighted statistics. Responses were based on questions asked of one "sample adult" selected from each household. Informed consent was obtained from all respondents. IRB approval was not required [9, 20].

Respondents were categorized as male or female, by race and ethnicity (Hispanic, non-Hispanic White [White], non-Hispanic Black [Black], and non-Hispanic Asian [Asian]). Respondents self-reported if their race and ethnicity was in a singular group unless they identified as Asian in which case they may consider the option of any other group in addition. Responses of other multiple races without a single identification were categorized as missing.

Additional sociodemographic characteristics included age (18–29, 30–44, 45–64, 65 years and over), marital status (living with spouse or partner, married or have a partner but not living with spouse or partner, widowed, divorced/separated, or never married), region of residence (Northeast, Midwest, South, West), and education level (< high school

graduate, high school graduate or General Educational Development [GED] equivalent, some college or an associate's degree, bachelor's or master's degree, doctoral or professional degree). Marital status and region were included because they are associated with health [17, 24].

Health-Related Characteristics

COVID-19 Positivity Status

COVID-19 positive status was based on a “yes” response to “has a health professional ever told you that you likely had coronavirus?” The question is in the 2020 NHIS only [6].

Health Insurance Coverage

Private insurance was defined as coverage through employer(s), union(s), or purchase. Public insurance was defined as Medicaid and Medicare. Persons without private or public insurance were considered uninsured. A variable called Health Coverage Type grouped insurance coverage as Medicaid, Private Insurance, Medicare, Medicare and Private Insurance and No Coverage. Survey questions about utilization as it relates to COVID-19 were asked in the 2020 NHIS only. The 2020 NHIS phrased the utilization questions in terms of whether respondents experienced delays or denials due to the COVID-19 pandemic, suggesting that the pandemic itself may have been a barrier to utilization.

Health Care Utilization

Health utilization questions as posed by the NHIS were asked of respondents. Responses were either “yes” or “no”. The NHIS utilization questions are reported below, as stated in the NHIS, and the abbreviation of the indicators is presented in parentheses, as follows: Did not get medical care because of the coronavirus pandemic, Delayed getting medical care because of the coronavirus pandemic (delay in medical care due to the COVID-19 pandemic).

Preventive Medical Care Indicators

The preventive medical care questions included a 12-month look back period. For this reason, the 2019 survey year included responses from 2018, and the 2020 survey year included responses from 2019. Overlap occurred in the 2020 data with the pre-pandemic survey year 2019 even after considering the months in 2019 in which COVID-19 emerged. For instance, respondents were asked in the 2020 and 2019 survey years “during the past 12 months, did you receive physical therapy, speech therapy, rehabilitative therapy, or occupational therapy (PT)? The direction of this potential overlap would bias the results to the null as the 2020 survey

year responses could include events from pre pandemic months in 2019.

The questions about having a blood test for diabetes or a well care visit required responses be framed within a time period. For instance, never, within the past 12 months, within the last two years, and up to ten years ago or more. We excluded the never responses and dichotomized the remaining responses into positive response for within the last 12 months and negative response for 2 years or more.

Number of Chronic Health Conditions

The number of chronic health conditions (0, 1, or ≥ 2) included chronic obstructive pulmonary disease (COPD), diabetes, heart disease, hypertension, stroke, and cancer [23]. Hypertension was defined as being told by a health professional of meeting criteria for hypertension on two different visits. Heart disease was based on being told of coronary heart disease, angina, a heart attack, or any other heart condition. Diabetes and stroke were also based on being told by a clinician of these conditions. Cancer was based on having been told of a malignancy. COPD was based on positive responses to being told of COPD. Blood pressure had 100 missing records, COPD had 87 missing responses, stroke had 80 missing responses, and cancer had 79 missing responses. We excluded records with missing data from the multivariable analyses but retained them in the overall study population.

Statistical Analysis

We used SAS-callable SUDAAN version 11.0.3 (RTI International) to calculate point estimates and 95% CIs. We used Rao–Scott χ^2 statistics for weighted surveys to evaluate categorical variables at $\alpha=0.05$ level (2-sided). Correction for multiple comparisons was not conducted [25]. For Table 1 the unweighted number and weighted proportion (95% confidence interval) are reported by survey year 2019 and 2020 and by Health Coverage Type, and Preventive Health Care indicators. Variables nonsignificant at the bivariate level were still considered for multivariable models [8, 22].

The multivariable logistic regression models reported in Table 2 predicted the likelihood of having a diabetes screening blood test, a well care visit, and receiving PT in 2020 compared to 2019 in three separate models. Therefore, survey year was our main exposure of interest. Independent variables included gender, race and ethnicity, age group, marital status, education level, region, number of chronic health conditions, and income relative to the federal poverty line (FPL). The model in Table 3 using only 2020 data, predicted not getting medical care due to COVID-19 compared to reporting getting medical care during the COVID-19 pandemic. The multivariable model in Table 3 used only 2020

Table 1 Sociodemographic variables, health insurance coverage type, and preventive medical care indicators by survey year in adults aged 18 years and over in the United States, NHIS: 2019–2020

Characteristic	2019	2020	Rao Scott Chi- square P-value
Overall unweighted sample size by year	31,997	31,568	Not Significant
Weighted percent (Confidence Intervals)			
<i>Health insurance coverage type</i>			
No coverage	12.0(11.3,12.6)	11.4(10.7,12.1)	< .05
Medicaid	12.1(11.4,12.7)	11.7(11.0,12.5)	
Private insurance	65.2(64.2,66.1)	65.3(64.3,66.4)	
Medicare	10.4(9.9,10.8)	11.0(10.5,11.5)	
Medicare and private insurance	.24(.18, .31)	.33(.25,.41)	
<i>Preventive health care indicators</i>			
Last time you had a blood test for diabetes?			
Never	8.0(7.5,8.5)	6.9(6.4,7.4)	< .0001
Within past year (anytime less than 12 months)	67.3(66.4,68.1)	65.8(64.9,66.6)	
Within last 2 years (1 year but less than 3 years)	9.5(9.0,9.9)	12.0(11.5,12.5)	
Within last 3 years (2 years but less than 5 years)	3.7(3.4,3.9)	4.4(4.1,4.8)	
Within last 5 years (3 years but less than 10 years)	3.0(2.8,3.3)	3.7(3.4,4.0)	
Within the last 10 (5 years but less than 10 years ago)	1.8(1.6,1.9)	2.3(2.1,2.6)	
10 years ago or more	1.7(1.5,1.9)	1.9(1.7,2.1)	
When was your last well care visit?			
Never	2.4(1.8,2.9)	2.0(1.5,2.5)	Not Significant
Within past year (anytime less than 12 months)	53.9(52.3,55.4)	52.5(50.7,54.3)	
Within last 2 years (1 year but less than 3 years)	15.3(14.3,16.3)	18.0(16.6,19.4)	
Within last 3 years (2 years but less than 5 years)	7.2(6.4,8.0)	7.0(6.1,7.8)	
Within last 5 years (3 years but less than 10 years)	7.5(6.7,8.3)	6.8(5.9,7.7)	
Within the last 10 (5 years but less than 10 years ago)	5.3(4.6,6.0)	4.9(4.2,5.7)	
10 years ago or more	6.5(5.7,7.2)	6.4(5.6,7.3)	
Did not receive physical therapy, speech therapy, rehabilitation therapy or occupational therapy in the last 12 months?	88.7(88.2,89.1)	89.4(89.0,89.8)	.01

data and included the same independent covariates as the models reported in Table 2, and also included an additional independent variable, COVID-19 positivity status.

Results

Sample Characteristics

The unweighted sample size included 31,997 adults in 2019 representing 250,916,572 adults nationwide, and 31,568 adults in 2020 representing 252,052,044 adults nationwide. The mean age was 52.8 years (SD = range: 18–99 years). Most respondents were female (51.7%). The sample included respondents with the following race and ethnicities: White (63.8%), followed by Hispanic (16.8%), Black (11.8%), and Asian (7.4%) adults. The greatest proportion resided in the South (37.7%) followed by the West (23.5%), Midwest (20.9%), and Northeast (17.6%).

In 2019 through 2020 health coverage type varied by race and ethnicity ($P < 0.0001$). Hispanic adults had the greatest likelihood of no insurance coverage (28% CI = 26.1%, 30.0%) followed by Black adults (12.6% CI = 11.6%, 12.7%) and Asian adults (10.5% CI = 8.6%, 12.5%). Black adults were the most likely to be on Medicaid (22.0% CI = 20.3%, 23.8%) compared to all other race and ethnic groups. White adults were most likely to have private coverage (72.1% CI = 71.2%, 72.9%) compared to all other race and ethnic groups.

In the 2019 and 2020 survey year, Black adults were more likely to have a blood test compared to all other groups ($P < 0.0001$). However, the numbers of people getting blood test for all race ethnicities was lower in 2020 compared to 2019. Similarly, for well care visits, Black adults were more likely to have a visit in the 2019 and 2020 survey years compared to White adults ($P < 0.05$ for both 2019; $P < 0.001$ for 2020); and for PT (2019: 10.0%, 11.1%, 5.8% vs. 72.9%, respectively; 2020: 10.8%, 10.0%, 6.0% vs. 73.0%, respectively). In 2020 about 635 adults representing 5,241,894

Table 2 Multivariate logistic regression models of the associations between preventive medical care utilization indicators adjusting for survey year, number of chronic health conditions, sociodemographic characteristics and health coverage type among adults aged 18 and over: NHIS 2019–2020

Dependent variables: preventive medical care indicators	A blood test for diabetes within the last 12 months vs. had a blood test for diabetes in the last 12 months to 2 years or more	Saw a doctor for a well care visit within the last 12 months vs. saw a doctor for a well care visit in the last 12 months to 2 years or more	Had physical therapy, speech therapy, rehabilitation therapy or occupation therapy within the last 12 months vs. did not have physical therapy, speech therapy, rehabilitation therapy or occupation therapy in the last 12 months
Independent variables: Main predictor of interest Survey Year			
Survey Year (Reference 2019)	.83(.76,.90)***	.98(.84,1.1)	.97 (.89, 1.0)
Female (Reference: Male)	1.3(1.1,1.4)***	1.9(1.6,2.2)***	1.2(1.1,1.3)***
Race and Ethnicity (Reference: non-Hispanic White)			
Hispanic	1.5(1.3,.1.8)***	1.6(1.2,2.2)**	.62(.51,.75)***
Non-Hispanic Black	1.7(1.5,2.0)***	1.84(1.3,2.5)***	.84(.71,.98)*
Non-Hispanic Asian	1.3(1.1,1.5)***	1.0(.76,1.4)	.67(.53,.86)**
Age group (years) (reference: 18- 29 years)			
29–44 years	1.0(.94, 1.2)	.81(.63,1.0)	1.2(1.0,1.5)*
45 to 64 Years	1.7(1.4,1.9)***	1.4(1.1,1.7)*	1.5(1.2,1.9)***
65 years and over	3.2(2.7,3.9)***	2.3(1.7,3.2)***	2.2(1.8, 2.8)***
Marital status (reference: Living with a spouse/partner)			
Not living with a spouse/partner	.80(.62,1.0)	.76(.46,1.2)	1.1(.87,1.5)
Widowed	.84(.69,1.0)	.81(.61,1.0)	1.2(1.0,1.4)**
Divorced or separated	.82(.73,.93)*	.76(.60, .95)***	1.0(.91,1.1)
Never married	.98(.87,1.1)	.85(.70,1.0)	1.1(1.0,1.3)
Region (reference: South)			
North East	.89(.77,1.0)	.91(.69,1.2)	1.0(.86,1.1)
Midwest	1.1(.97,1.2)	.89(.69,1.1)	.87(.76,1.0)
West	.80(.69,.92)*	.73(.56,.95)	1.1(1.0,1.3)*
Education level (reference: No high school degree)			
High school or GED	.99(.83,1.1)	.75(.52,1.0)	1.0(.86,1.2)
Some college or Associates degree	1.0(.88,1.2)	1.0(.7,1.5)	1.2(.97,1.4)*
Bachelor’s degree	1.1(.96,1.3)	.96(.66, 1.3)	1.3(1.1,1.6)***
Professional or graduate degree	1.1(.91,1.4)	1.0(.64,1.8)	1.4(1.0,1.9)***
Number of chronic health conditions (Reference: none)			
1 Chronic Health Condition	1.9(1.7,2.1)***	1.6(1.4,2.0)***	1.4(1.2,1.5)***
2 or more Chronic Health Conditions	4.6(3.9,5.4)***	3.9(3.0,5.1)***	2.1(1.9,2.4)***
Health coverage type (Reference: Private Insurance)			
Not covered	.35(.31,.41)***	.26(.19,.35)***	.48(.36,.64)***
Medicaid	1.0(.91,1.2)	1.3(1.0,1.8)*	1.6(1.3,2.0)***
Medicare	.90(.76,1.0)	1.2(.92,1.6)	1.0(.91,1.1)
Private insurance and medicare	.95(.46,1.9)	1.8(.51,6.7)	1.5(.84,2.9)*
Poverty index ratio (Reference: Less than the Federal Poverty Line)			
100–199% of the Federal Poverty Line	1.0(.89,1.2)	1.2(.91,1.6)	1.0(.86,1.2)
200–399% of the Federal Poverty Line	1.1(.92,1.3)	1.5(1.0,2.1)*	1.0(.82,1.2)
400% or more of the Federal Poverty Line	1.2(1.0,1.5)*	1.8(1.3,2.6)***	1.1(.94,1.4)*

^a Independent variables included Survey Year, Gender, Race and Ethnicity, Age Group, Living Arrangements, Region of residence at the time of interview, Education level, Number of chronic health conditions, Health coverage type, and Poverty Index Ratio (PIR)

* Rao Scott Chi-Square *P* value ≤ .05

** Rao Scott Chi-Square *P* value < .01

*** Rao Scott Chi-Square *P* value < .001

Table 3 Multivariate logistic regression models of the associations between a medical care utilization indicator adjusting for COVID-19 status, gender, race and ethnicity, age group, living arrangements, region of residence at the time of interview, education level, number of chronic health conditions, health coverage type and Poverty Index Ratio among adults aged 18 and over: NHIS 2020

	Not getting medical care due to the COVID-19 pandemic vs. getting medical care during the COVID-19 pandemic
Had COVID-19 (reference: the absence of COVID-19)	1.6(1.2,2.2)**
Female (Reference: Male)	1.5(1.3,1.6)***
Race and Ethnicity (Reference: non-Hispanic White)	
Hispanic	1.0(.88,1.2)
Non-Hispanic Black	.84(.68,1.0)
Non-Hispanic Asian	.98(.78,1.2)
Age group (years) (reference: 18- 29 years)	
29–44 years	1.2(.96,1.5)
45 to 64 Years	1.4(1.1,1.8)*
65 years and over	.91(.68,1.2)
Living Arrangements (reference: living with a spouse/partner)	
Not living with a spouse/partner	1.3(.74,2.3)
Widowed	.96(.77,1.2)
Divorced or separated	1.1(1.0,1.3)*
Never married	1.0(.89,1.2)
Region (reference: South)	
Northeast	.76(.62,.92)*
Midwest	.81(.68,.96)*
West	.85(.70,1.0)
Education level (reference: No high school degree)	
High school or GED	1.1(.90,1.5)
Some college or Associates degree	1.5(1.2,2.0)***
Bachelor's degree	1.9(1.5,2.5)***
Professional or graduate degree	2.2(1.5,3.1)***
Number of chronic health conditions (Reference: none)	
1 Chronic Health Condition	1.6(1.3,1.9)***
2 or more Chronic Health Conditions	2.0(1.7,2.4)**
Health coverage type (Reference: Private Insurance)	
Not covered	.94 (.74,1.2)
Medicaid	1.7(1.3,2.1)***
Medicare	1.1(.94,1.3)
Private insurance and medicare	1.7(.85,3.7)
Poverty Index Ratio (Reference: Less than the Federal Poverty Line)	
100–199% of the Federal Poverty Line	.86(.67,1.1)
200–399% of the Federal Poverty Line	.90(.68,1.1)
400% or more of the Federal Poverty Line	.89(.68,1.1)

^a The reference level for Positive COVID-19 status and Utilization indicators was their absence

^b Independent variables included COVID-19 Status, Number of Chronic Health Conditions, Age Group, Race/Ethnicity, Gender, Poverty Index Ratio and Region of residence at the time of interview

*Rao Scott Chi-Square P value $\leq .05$

**Rao Scott Chi-Square P value $< .01$

***Rao Scott Chi-Square P value $< .001$

adults nation-wide were informed that they had COVID-19. Compared to all other race and ethnic groups, Hispanic and Black adults were more likely to receive a diagnosis of COVID-19 ($P < 0.0001$).

Bivariate Analyses Table 1

Among individuals reporting their health coverage type there was a lowered likelihood of having no coverage, or Medicaid

coverage, and had a higher likelihood of having Medicare coverage from survey years 2019 to 2020 (Table 1). There was also a higher likelihood of reporting Medicare and Medicare and Private insurance from survey years 2019 to 2020 (Table 2) (Overall $P < 0.05$). There was a lowered likelihood of reporting never having a blood test, and having a blood test for diabetes within the last 12 months from the 2019 to 2020 survey years (Table 1). There was a greater likelihood of reporting having had a blood test for diabetes in the last two to ten years from survey years 2019 to 2020 (Table 1) (Overall P -value $< .001$).

Multivariable Analysis- Models Presented in Tables 2 and 3

In the fully adjusted multivariable models, the likelihood of receiving a blood test to screen for diabetes was lower in the 2020 survey year compared to the 2019 survey year (aOR = 0.83 CI = .0.76, 0.90) ($P < 0.0001$) (Table 2). For having a well-care visit and receiving PT, the lowered likelihood in the 2020 survey year was only marginally insignificant from the 2019 survey year (aOR = 0.98 CI = 0.84, 1.1; aOR = 0.97 CI = 0.89, 1.0; respectively). Black, Hispanic, and Asian adults compared to White adults had a lowered likelihood of having PT ((aOR = 0.84 CI = 0.71, 0.98); (aOR = 0.62 CI = 0.51, 0.75); (aOR = 0.67 CI = 0.53, 0.86); respectively) (Table 2). However, Black, Hispanic and Asian adults had a higher likelihood of having a blood test for diabetes and a well care visit compared to White adults (Table 2). Adults who did not have coverage compared to private coverage had a lowered likelihood of a blood test for diabetes, a well care visit and PT ((Blood Test: aOR = 0.35 CI = 0.31, 0.41); (Well care visit: aOR = 0.26 CI = 0.19, 0.35) and (PT: aOR = 0.48 CI = 0.36, 0.64)) (Table 2). Similarly, adults with Medicaid compared to private coverage had a higher likelihood of having a well care visit and PT ((Well care: aOR = 1.3 CI = 1.0, 1.8); (PT: aOR 1.6 CI = 1.3, 2.0)) (Table 2). Being in the highest income compared to the lowest income group was associated with a higher likelihood of receiving all three preventive medical care indicators (Table 2). However, in 2020, Medicaid compared to private coverage was also associated with a higher likelihood of not getting medical care because of the COVID-19 pandemic (aOR = 1.7 CI = 1.3, 2.1) (Table 3).

Discussion

The major finding from this study was that key NHIS survey indicators of preventive medical care were lower in the 2020 relative to the 2019 survey year, including receiving a blood test to assess the presence of diabetes.

The decrease in having a blood test for diabetes screening demonstrated a clear turnaround from what had been an annual increase in previous pre-pandemic years, based on our study findings. The decrease in well care visits and PT in the adjusted models was only marginally insignificant but the directions of the associations (the odds ratios were less than 1) suggest a potential trend of lowered utilization that also may have been demonstrated at the bivariate level. Future research encompassing more pandemic years is necessary to establish trends in utilization of medical care compared to the pre-pandemic baseline. Moreover, the lowered use of preventive medical care in the first year of the pandemic was striking, because the lockdown occurred in March 2020, and our study compared the 2020 survey year to the full 2019 survey year. The study results may have been biased to the null because of the inclusion of pre-pandemic data that was not impacted by COVID-19, in the 2020 survey year.

The implications for the decrease are many—there may be people who did not initially receive appropriate care but later utilized care when illness became more acute than otherwise in the counterfactual without COVID-19 [13]. Lack of early intervention especially for diabetes could damage the eyes, kidneys, and other organs [13]. Similarly, not getting well care and PT could have resulted in untreated diseases, leaving individuals at risk for poor outcomes and a lowered quality of life [1]. The decrease in the preventive medical interventions may enhance poor outcomes because individuals who had limited utilization of PT may not prevent future invasive procedures [15]. Our data demonstrated that PT utilization was on average lower in 2020 compared to 2019 for Black, Hispanic, and Asian adults compared to White adults. Minority populations in the best scenario have a higher risk of lowered utilization, suggesting that the pandemic may have widened the gap of medical disparities compared to White adults [16].

An additional major finding was the strong relationship between having no coverage and not receiving preventive medical care. Similarly, the highest utilization of preventive medical care was among those respondents in the highest compared to the lowest income group. Medicaid appeared in our study to offer a safety net for utilizing preventive medical care in the pandemic for those in the lowest income group, although not necessarily for emergency or acute care. Paradoxically, Medicaid recipients reported both utilization of preventive medical care and a high likelihood of not getting medical care because of the COVID-19 pandemic. This contradictory pattern suggests that Medicaid patients may have received preventive care but may not have gotten acute care for COVID-19 or other medical disorders, due to the COVID-19 pandemic. An examination of where Black and Hispanic adults who had

Medicaid sought medical care, and whether it differed for preventive and acute medical care could elucidate the role of health coverage in utilization during the first year of the COVID-19 pandemic.

Several limitations of the present report are acknowledged. Lack of mortality data prohibited reporting findings regarding mortality during the COVID-19 pandemic. Future research could include an examination of the relationship between mortality, health coverage, race and ethnicity. The cross-sectional design prevented the assessment of temporal ordering. Lack of monthly data may have resulted in an underestimate of the association between the pandemic and forgoing preventive care. A future study using monthly data could examine the relationship between the lockdown and the reduction of preventive medical care utilization. It is also possible that the demographic characteristics of the population changed from 2019 to 2020, because of the dramatic increase in mortality from COVID-19 and from changes in education and the job market due to the pandemic. There may have been confounding due to a changing population that was not accounted for when comparing these survey years.

Future analysis warrants a closer examination of complex relationships including potential interactions between income and health coverage. Region may not have been sufficient to examine the relationship between preventive care and geography. This limitation could be corrected with a potential examination of zip code data, or alternatively census tract data, income, race and ethnicity and health insurance coverage.

The NHIS is high-quality national data that provides the best estimates for preventive medical care utilization before and during the COVID-19 pandemic. Moreover, this study introduces the possibility that sociodemographic characteristics and health insurance coverage impacted medical care utilization during the pandemic. As such, we believe this report provides an important initial step in understanding these health implications for COVID-19.

Implications for Practice

Outreach to individuals who missed preventive medical care during the first year of the pandemic may be necessary. Medicaid appeared to provide a safety net for preventive care, however it may not have protected against not getting acute medical care during the pandemic. Further examination is needed to understand why COVID-19 was a potential barrier for Medicaid recipients receiving acute medical care. An analysis of the relationship between race and ethnicity, and structural barriers from health insurance coverage during the pandemic is warranted based on this analysis.

Authors' Contributions All authors contributed to every aspect of the production of this study.

Data Availability The data is from the NHIS which is a publicly available data set.

Code Availability The authors can make the SAS code available.

Declarations

All authors provided: (1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data for the article; (2) drafting of the article or reviewing it and revising it critically for important intellectual content; and (3) final approval of the version to be published.

Ethics Approval Because the data was publicly available and the study subjects were consented by the CDC and made anonymous by the CDC in the production of the data, no IRB approval was required.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflicts of Interest/Competing Interests None of the authors have competing or conflicting interests.

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