# Characteristics of community-dwelling older individuals who delayed care during the COVID-19 pandemic

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A B S T R A C T

*Background:* Disruptions and reductions in healthcare services, coupled with infection concerns in the public, have caused widespread delay in health care during the COVID-19 pandemic. Persons with disability were at increased risk for deferred care. This study aimed to examine the extent of delayed care among older US individuals by disability status, identify characteristics associated with delayed care, and explore potential barriers to care during the pandemic.
*Methods:* Data were drawn from the Health and Retirement Study (HRS) 2020 Core Early Release. Community-dwelling adults over age 50 ($n = 15145$) were classified as having ADL (or IADL) impairment versus no impairment. Distributions of demographic, clinical, and psychosocial characteristics, delayed care, and barriers to care were compared between disability groups. Characteristics associated with delayed care were identified with the multivariable logistic regression model with multiple imputation.
*Results:* 30.7% of older individuals delayed care. ADL/IADL impairment was associated with delayed care overall and in specific domains. Sociodemographic (e.g., younger age and higher socioeconomic status), clinical (e.g., disability, psychiatric conditions, pain, and severe fatigue), and psychosocial (e.g., concerns about the pandemic, perceived financial insecurity, and loneliness) characteristics were associated with delayed care. Financial barrier to care and fear disproportionately affected those with social and clinical vulnerabilities, whereas reductions in healthcare services had a greater impact on those with socioeconomic well-being.
*Conclusion:* Efforts should be directed to increase receipt of needed care among vulnerable older individuals. Both pandemic-induced and long-standing barriers to care among disparate subpopulations should be considered in alternative care delivery models.

## 1. Introduction

The COVID-19 pandemic has wide-ranging impacts on the provision and receipt of healthcare services. Pandemic containment efforts such as stay-at-home / lockdown orders, suspension of medical services and temporary closure of facilities (Czeisler et al., 2020), shutdown of public transportation (Chen et al., 2020), and infection concerns in the general public have caused widespread delays in health care. The estimated prevalence of healthcare delays in the US during the pandemic was between 20% and nearly 50% (Anderson et al., 2021; Centers for Medicare and Medicaid Services, 2020; Czeisler et al., 2020; Findling et al., 2020; Giannouchos et al., 2022; Papautsky et al., 2021). Delays in dental care was estimated to be 47 and 38% in the general population in previous studies (Kranz et al., 2021; Papautsky et al., 2021), and 43% among adults aged 65 years and above (Centers for Medicare and Medicaid Services, 2020). Though government-issued mitigation strategies to cancel and postpone non-urgent medical care aimed at reallocating resources and increasing capacity for COVID-19 related care, the negative consequences of delaying care in a large proportion of patients are multifaceted, such as excess in mortality, deterioration of physical functions, disease progression, delayed diagnoses with missed

opportunity for early intervention, and care-giver stress (Manacorda et al., 2020).

Due to the broad disruptions to usual health and social care services, people living with disabilities were identified as a high-risk group for delayed medical care in population-based surveys (Czeisler et al., 2021; Czeisler et al., 2020) and in specific patient groups such as multiple sclerosis (Manacorda et al., 2020). Those with greater disability reported higher level of lack of usual care, rehabilitation, and specialist services, and experienced poorer health consequences, higher out-of-pocket costs, and greater caregiver burden (Manacorda et al., 2020).

Following CDC recommendations, US healthcare facilities postponed elective surgeries, non-urgent procedures, and visits (Bettger et al., 2020). Rehabilitation beds and staff were reallocated to acute inpatient care, and outpatient rehabilitation was reserved only for high need patients. Suspension of care in other medical specialty fields may also result in potential even irreversible loss of physical functions. For instance, the suspension in ophthalmological procedures after first month of local lockdown in 10 European countries caused concerns in that delay or suspension in essential eye procedures can result in significant and rapid vision impairment to irreversible blindness (Toro

et al., 2021). Furthermore, persons with disabilities and disability advocates expressed concerns that crisis triage protocols have not adequately prioritize the lives of those living with disabilities in allocation of life-saving healthcare resources (Chen et al., 2020; Solomon et al., 2020).

The wide-ranging effects of Covid-19 pandemic on the healthcare experiences in the disability population have been understudied (Drum et al., 2011; Sabatello et al., 2020). Among individuals living with disabilities who previously relied on a personal care aide for assistance, half of them reported having not received the services during the pandemic (Chen et al., 2020). The social distancing rule may have restricted transportation to care due to reduced rides from informal support networks. Telehealth can potentially alleviate challenges of transportation and social distancing during the pandemic; however, technology challenges especially for those with disabilities and privacy concerns may impede access to telemedicine (Sabatello et al., 2020).

Although certain sociodemographic characteristics and medical conditions were identified to be associated with avoiding or delaying care during the pandemic, including younger age, female gender, higher education, lack of insurance coverage, financial difficulty, minority race or ethnicity, unpaid caregivers, depression and anxiety (Czeisler et al., 2020), the impact of reduced access to care on the care-seeking behaviors of older persons with common chronic diseases (e.g., diabetes and heart diseases) and disabling conditions (e.g., pain, fatigue, and incontinence) have yet to be explored.

When government-endorsed strategies were first implemented to prevent rapid spread of the coronavirus, many people were not prepared for the self-isolating prevention measures that could be socially and mentally detrimental. These psychosocial factors inevitably played a role in one's motivation and decision to seek care. Psychosocial mechanisms such as perceptions about the COVID-19 pandemic, social isolation, social support, and personal control may have different effects on care-seeking behaviors.

It is of importance to evaluate the risk of COVID and benefits of continuity of needed care especially for the vulnerable individuals during the pandemic. Damage caused by delayed treatment can be irreversible and could lead to a dramatic increase in disability and unsustainable social costs for many governments (Toro et al., 2021). The objectives of this study were to examine the extent of delayed care among US adults aged 50 years and older according to their disability status, identify demographic, clinical, and psychosocial factors associated with delayed care, and explore potential barriers to care during the COVID-19 pandemic.

## 2. Methods

### 2.1. Data source

This analysis uses early release data from the Health and Retirement Study (HRS), 2020 HRS Early Core, sponsored by the National Institute on Aging (grant number NIA U01AG009740) and conducted by the University of Michigan. HRS is a national longitudinal study of health, economic, social and family status, and support systems of older Americans. The HRS was initiated in 1992, and was fielded every two years (Sonnega et al., 2014). The survey included seven cohorts: the initial cohort (born 1931–41) and their spouses, the cohort of Assets and Health Dynamics among the Oldest Old (AHEAD, born 1890–1923), the Children of the Depression (born 1924–30), the War Babies (born 1942–47), Early Baby Boomers (born 1948–53), Mid Baby Boomers (born 1954-59), and Late Baby Boomers (born 1960-65). A primary respondent is randomly selected from all age-eligible (18+) household members and their spouse or partner if any, regardless of age. The HRS

oversampled African-American and Hispanic households. The data collection period for the 2020 survey was March 2020 through May 2021. Due to the restrictions on social contact during the fieldwork period, partial interviews were conducted via telephone or web. COVID-19-related questions were included in the 2020 core interview. The initial sample for our analysis included community-dwelling adults aged 50 years and older (*N* = 15145).

### 2.2. Outcome variables

The main outcome delayed care was measured by the question "Since March 2020, was there any time when you needed medical or dental care, but delayed getting it, or did not get it at all?" The response was a dichotomous variable (yes vs. no). Five types of delayed care were provided as follow-up questions for those who reported delayed care, including surgery, seeing a doctor, filling prescription medications, dental care, and other. Responses were coded as dichotomous (yes vs. no). Reasons for delaying care were listed as "could not afford it", "could not get an appointment", "the clinic/doctor's office cancelled, closed, or suggested rescheduling", "decided it could wait", "was afraid to go", and "other reasons". A dichotomous response (yes vs. no) was provided for each reason.

### 2.3. Explanatory variables

#### 2.3.1. ADL/IADL impairment

Disability status was measured by Activity of Daily Living (ADL) and Instrumental Activity of Daily Living (IADL) functions. ADL functions describe the physical functions performing common daily tasks required for independent living and self-care (Wiener et al., 1990). The respondents were asked six questions about difficulty in performing ADL functions: walking, getting in/out of bed, dressing, bathing, toileting, and eating. A dichotomous response (yes vs. no) to each question was provided. A count of number of "yes" was calculated for each respondent, ranging from 0 to 6. ADL impairment was classified into two categories: no limitation (ADL=0) vs. 1 or more limitation (ADL≥ 1). IADLs are more complex functions than ADLs and involve cognitive functioning. IADL impairment was assessed with five questions asking any difficulty in five IADL functions due to health or memory problems: preparing meals, shopping, making a phone call, taking medication, and managing finances. The total number of IADL difficulties was calculated for each respondent, ranging from 0 to 5. IADL impairment was then classified into two categories: no limitation (IADL=0) vs. 1 or more limitation (IADL≥ 1).

#### 2.3.2. Sociodemographic variables

Sociodemographic variables consisted of age group (50–64, 65–74, ≥ 75), gender (male vs. female), race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Other), education (less than high school, high school diploma or GED, some college or associated degree, university degree or above), marital status (married vs. unmarried), household income (four quartiles), and insurance coverage (yes vs. no) including Medicare, Medicaid, CHAMPUS, and private health insurance. Specifically, the household income took the sum of income earned in the past year by both the respondent and the spouse from sources including employment (including self-employment), social security, supplementary security income, veteran benefits, welfare, worker's compensation, pensions, IRA accounts, bond, stocks, annuities, and rental properties.

#### 2.3.3. Health status and clinical diagnoses

Health status was indexed by dichotomized self-rated health (excellent/very good/good vs. fair/poor). Self-reported vision and

hearing impairment was each dichotomized as yes (fair or poor) vs. no (excellent, very good, or good). Respondent self-reported diagnoses of chronic conditions were dichotomized (yes vs. no), including arthritis, high blood pressure, cancer (excluding skin cancer), depression, dementia, diabetes, heart disease, lung disease, stroke, psychiatric conditions, urinary incontinence (UI), and sleep disorder. They also reported trouble of pain and experience of severe fatigue or exhaustion, and use of opioids (Vicodin, OxyContin, codeine, morphine, or similar medications), which were all coded as dichotomous variables (yes vs. no).

### 2.3.4. Experiences with COVID

Three variables related to the COVID-19 pandemic were assessed for each respondent: ever had COVID (yes, no, or not sure), ever knew anybody who had died from COVID (yes vs. no), and self-rated concerns about the pandemic on a 1 to 10 scale where 1 represented least concerned and 10 most concerned (a continuous variable ranging from 1 to 10).

### 2.3.5. Psychosocial constructs

Psychosocial constructs considered for delayed care included perceived financial security, loneliness, personal control, and social support (operationalized as family and friend support). Each psychosocial construct was measured with multiple questions. Likert scale responses were reverse-coded when appropriate so that a higher value reflected a higher degree of the construct. Perceived financial security was measured with four questions with a 5-point Likert scale response from always to never. Example questions were "Giving a gift for wedding, birthday or other occasion would put a strain on my finances for the month", "I have money left over at the end of the month", "I am behind with my finances," and "My finances control my life." Cronbach's alpha for this construct was 0.79. Social support was indicated by family support and friend support, each measured with three items. Each response was a 4-point Likert scale: a lot, some, a little, and not at all. The same three support questions, referring to family members and friends separately, were how much they understood the way the respondent felt about things, how much the respondent could rely on them when having a serious problem, and how much the respondent could open up to them about his/her worries. Cronbach's alpha was 0.87 for family support and 0.84 for friend support. Loneliness was measured by four items, each with a 3-point Likert scale response: often, some of the time, and hardly ever or never. The respondents were asked how much of the time they felt "lack companionship", "left out", "isolated from others", and "alone". Cronbach's alpha for this construct was 0.84. Personal control was measured by five questions, such as "I often feel helpless in dealing with the problems of life", "what happens in my life is often beyond my control." Each response was a 6-point Likert scale, from strongly disagree to strongly agree. Cronbach's alpha for this construct was 0.86.

### 2.4. Statistical analysis

The distributions of all covariates by ADL and IADL impairment status were assessed separately with the Chi-square test for categorical variables and the independent samples *t*-test for continuous variables. The univariate association of functional impairment with each outcome variable (overall delayed care, each subtype of delayed care, and each reason for delayed care) was assessed with Chi-square tests in separate ADL and IADL domains. Multivariable logistic regression models with backward selection were used to identify significant associations with overall delayed care in ADL and IADL domains. Due to a large proportion of respondents who were not asked the questions related to delayed care (5226 respondents) and psychosocial variables (more than 11100

respondents) and item nonresponse on other covariates, the sample size for adjusted models with complete case analysis dropped to *N* = 3007. To validate the adjusted models, multiple imputation (MI) was implemented to impute the missing values from item nonresponse (*N* = 20). The missing responses to questions related to delayed care due to the skipping pattern were not imputed. Each final imputed dataset contained 9919 individuals. For MI, missing at random (MAR) was assumed. MI was performed with the Fully Conditional Specification (FCS): binary logistic regression for dichotomous variables, multinomial logistic regression for nominal variable with more than 2 categories, and predictive mean matching (PMM) for continuous variables (Zhao & Long, 2017). Automatic backward selection was applied to 20 imputed datasets and generated a set of variables from each dataset. If an explanatory variable was consistently selected in all datasets (100% inclusion frequency), it was kept for the final analysis (Zhao & Long, 2017). In the final analysis, the same set of variables was included in a logistic regression model to assess their associations with delayed care in each dataset (Heymans et al., 2007; Zhao & Long, 2017). The estimates for each explanatory variable from all datasets (20 estimates per variable) were then combined into a single estimate with its standard error and converted into an odds ratio and 95% confidence interval. All analyses were done in SAS9.4.

## 3. Results

### 3.1. Distribution of covariates by ADL/IADL status

Table 1 shows the distributions of each covariate by ADL impairment. Compared to individuals without ADL impairment (ADL=0), those with such impairment (ADL ≥1) were more likely to be older (e.g., 38.0% vs. 25.8% aged 75 years and above), female, unmarried, and of Black race or Hispanic ethnicity. Compared to ADL intact individuals, ADL impaired individuals were also more likely to have lower levels of education (e.g., 25.5% vs. 13.0% having less than high school education) and make lower income. Older adults with ADL impairment were more likely than those without impairment to report poorer self-rated health (64.3% vs. 20.6%), impairment in vision (45.7% vs. 21.4%) and hearing (34.0% vs. 15.8%), and each of the assessed chronic conditions. They were also more likely to report symptoms such as severe fatigue, trouble with pain, and to take opioids. Those with ADL impairment reported greater loneliness, lower levels of perceived financial security, friend support, and personal control.

Respondents with IADL limitations reported similar disparities in sociodemographic characteristics, clinical conditions and symptoms, and psychosocial dimensions (see Appendix Table).

### 3.2. Association of ADL/IADL status with delayed care

As shown in Table 2, about 30.7% of sampled individuals reported having delayed care since March 2020. The type of reported delayed care with highest prevalence was dental care (22.3%), followed by doctor visits (17.5%). Compared to the respondents with intact ADL, those with ADL impairment were more likely to report overall delayed care (38.7% vs. 28.8%) and in specific domains of care such as surgery (7.5% vs. 3.0%), seeing the doctor (22.9% vs. 16.3%) filling prescription medications (4.8% vs. 1.9%), dental care (26.0% vs. 21.4%), and other. In the IADL domain, the results were similar. Compared to those with intact IADL, the respondents with IADL impairment were more likely to report having delayed care in general (39.0% vs. 29.2%) and each specific domain of care.

**Table 1**

Distribution of covariates by ADL status.

| Variable | class | Total | ADL=0 | ADL>=1 | *P*-value |
|---|---|---|---|---|---|
| Age group | 50–64 | 6402 (42.3) | 5397 (43.5) | 1005 (36.6) | <.0001 |
| | 65–74 | 4498 (29.7) | 3801 (30.7) | 697 (25.4) | |
| | ≥ 75 | 4243 (28.0) | 3201 (25.8) | 1042 (38.0) | |
| Gender | Male | 6174 (41.0) | 5178 (42.0) | 996 (36.4) | <.0001 |
| | Female | 8879 (59.0) | 7141 (58.0) | 1738 (63.6) | |
| Married | Yes | 8300 (55.1) | 7153 (58.0) | 1147 (42.1) | <.0001 |
| Race / Ethnicity | Non-Hispanic White | 8448 (56.6) | 7140 (58.5) | 1308 (48.1) | <.0001 |
| | Non-Hispanic Black | 3228 (21.6) | 2494 (20.4) | 734 (27.0) | |
| | Hispanic | 2516 (16.9) | 1967 (16.1) | 549 (20.2) | |
| | Other | 723 (4.8) | 596 (4.9) | 127 (4.7) | |
| Education | Below HS | 2297 (15.2) | 1599 (13.0) | 698 (25.5) | <.0001 |
| | HS graduate | 6888 (45.7) | 5604 (45.4) | 1284 (46.9) | |
| | Some College | 1935 (12.8) | 1608 (13) | 327 (12) | |
| | University | 3954 (26.2) | 3527 (28.6) | 427 (15.6) | |
| Household income | 1st quartile | 3133 (24.9) | 2152 (20.9) | 981 (43.6) | <.0001 |
| | 2nd quartile | 3147 (25.1) | 2482 (24.1) | 665 (29.6) | |
| | 3rd quartile | 3143 (25) | 2739 (26.6) | 404 (18.0) | |
| | 4th quartile | 3138 (25) | 2939 (28.5) | 199 (8.8) | |
| Insurance | Yes | 13880 (93.1) | 11333 (92.8) | 2547 (94.3) | 0.0080 |
| Self-rated health | Poor /Fair | 4307 (28.5) | 2546 (20.6) | 1761 (64.3) | <.0001 |
| | Excellent/very good/good | 10818 (71.5) | 9840 (79.4) | 978 (35.7) | |
| Vision impairment | Yes | 3883 (25.8) | 2636 (21.4) | 1247 (45.7) | <.0001 |
| Hearing Impairment | Yes | 2883 (19.1) | 1954 (15.8) | 929 (34.0) | <.0001 |
| Arthritis | Yes | 9024 (59.7) | 6752 (54.5) | 2272 (83.0) | <.0001 |
| High Blood Pressure | Yes | 9489 (62.7) | 7397 (59.7) | 2092 (76.4) | <.0001 |
| Cancer | Yes | 2393 (15.8) | 1830 (14.8) | 563 (20.6) | <.0001 |
| Dementia | Yes | 366 (2.4) | 157 (1.3) | 209 (7.9) | <.0001 |
| Diabetes | Yes | 4257 (28.2) | 3170 (25.6) | 1087 (39.7) | <.0001 |
| Heart disease | Yes | 3558 (23.5) | 2524 (20.4) | 1034 (37.8) | <.0001 |
| Lung disease | Yes | 1649 (10.9) | 1034 (8.3) | 615 (22.5) | <.0001 |
| Stroke | Yes | 1169 (7.7) | 693 (5.6) | 476 (17.4) | <.0001 |
| Psychiatric conditions | Yes | 3106 (20.5) | 2074 (16.7) | 1032 (37.7) | <.0001 |
| Fatigue | Yes | 2693 (17.9) | 1533 (12.4) | 1160 (42.7) | <.0001 |
| Incontinence | Yes | 3996 (26.5) | 2814 (22.8) | 1182 (43.4) | <.0001 |
| Sleep disorder | Yes | 2542 (16.9) | 1782 (14.4) | 760 (27.9) | <.0001 |
| Pain | Yes | 6125 (40.7) | 4089 (33.2) | 2036 (74.5) | <.0001 |
| Use of opioids | Yes | 1625 (10.8) | 978 (7.9) | 647 (24.0) | <.0001 |
| Had COVID | No | 9396 (94.8) | 7586 (94.8) | 1810 (94.4) | 0.7255 |
| | Yes | 428 (4.3) | 341 (4.3) | 87 (4.5) | |
| | Not Sure | 92 (0.9) | 72 (0.9) | 20 (1.0) | |
| Know someone died from COVID | Yes | 2631 (27.7) | 2143 (27.9) | 488 (27.1) | 0.5228 |
| Concern about pandemic | Mean (SD) | 7.85 (2.66) | 7.83 (2.60) | 7.94 (2.87) | 0.1318 |
| Financial security | Mean (SD) | 3.98 (0.65) | 4.06 (0.82) | 3.58 (0.96) | <.0001 |
| Family support | Mean (SD) | 2.95 (0.87) | 2.96 (0.86) | 2.89 (0.89) | 0.0567 |
| Friend support | Mean (SD) | 3.98 (0.86) | 3.14 (0.73) | 3.02 (0.77) | 0.0004 |
| Loneliness | Mean (SD) | 1.52 (0.55) | 1.48 (0.53) | 1.73 (0.62) | <.0001 |
| Personal control | Mean (SD) | 4.92 (1.14) | 5.03 (1.06) | 4.33 (1.34) | <.0001 |

Note. SD refers to standard deviation. For categorical variables, cell values are raw number and percentage in the parentheses; p values were derived from the Chi-square test. For continuous variables, cell values are mean and standard deviation in the parentheses; p values were derived from the independent samples t test.

### 3.3. Reasons for delayed care by ADL/IADL status

As shown in Table 3, the top three reasons for delayed care were "office cancellation or rescheduling" (51.9%), "decided it could wait" (33.7%), and "afraid to go" (24.3%). Among the respondents who reported delayed care, those with ADL impairment were more likely to report "could not afford it" (21.8% vs. 12.6%), and "other reasons" as the reasons for delaying care, but they were less likely to delay care due to "office cancelation, closure, or rescheduling" (45.4% vs. 53.9%) or because they "decided it could wait" (29.8% vs. 35.0%).

In the IADL domain, compared to older adults with intact ADL, those with IADL impairment were more likely to report "could not afford it", "afraid to go", or "other" reasons, but less likely to report "office cancellation or rescheduling" as their reasons for the delay.

### 3.4. Associations of delayed care with explanatory variables

Table 4 exhibits the associations of covariates with delayed care in adjusted multivariable logistic regressions with backward variable selection in separate ADL and IADL domains with complete case analysis.

**Table 2**

Types of delayed care by ADL and IADL status.

| Types of Care delayed | Total N = 9851 | ADL=0 N = 7955 | ADL≥1 N = 1896 | P value |
|---|---|---|---|---|
| Overall Care | 3027 (30.7) | 2293 (28.8) | 734 (38.7) | <.0001 |
| Surgery | 383 (3.9) | 242 (3.0) | 141 (7.5) | <.0001 |
| See the doctor | 1724 (17.5) | 1291 (16.3) | 433 (22.9) | <.0001 |
| Dental care | 2195 (22.3) | 1702 (21.4) | 493 (26.0) | <.0001 |
| Filling medications | 238 (2.4) | 148 (1.9) | 90 (4.8) | <.0001 |
| Other | 685 (7.0) | 475 (6.0) | 210 (11.1) | <.0001 |
| | **Total** N = 9806 | **IADL=0** N = 8247 | **IADL≥1** N = 1559 | **P value** |
| Overall Care | 3014 (30.7) | 2406 (29.2) | 608 (39.0) | <.0001 |
| Surgery | 379 (3.9) | 281 (3.4) | 98 (6.3) | <.0001 |
| Seeing the doctor | 1718 (17.6) | 1344 (16.3) | 374 (24.1) | <.0001 |
| Dental care | 2187 (22.3) | 1775 (21.5) | 412 (26.4) | <.0001 |
| Filling medications | 234 (2.4) | 147 (1.8) | 87 (5.6) | <.0001 |
| Other | 682 (7.0) | 497 (6.0) | 185 (11.9) | <.0001 |

Note. Cell values are raw number and percentage in the parentheses; p values were derived from the Chi-square test.

**Table 3**

Reasons for delayed care by ADL and IADL status among respondents who reported having delayed care.

| Reasons | Total N = 3027 | ADL=0 N = 2293 | ADL≥1 N = 734 | P value |
|---|---|---|---|---|
| Could not afford it | 450 (14.9) | 290 (12.6) | 160 (21.8) | <.0001 |
| Could not get an appointment | 477 (15.8) | 358 (15.6) | 119 (16.2) | 0.6979 |
| Office cancellation or rescheduling | 1570 (51.9) | 1237 (53.9) | 333 (45.4) | <.0001 |
| Decided it could wait | 1021 (33.7) | 802 (35.0) | 219 (29.8) | 0.0104 |
| Afraid to go | 736 (24.3) | 542 (23.6) | 194 (26.4) | 0.1247 |
| Other reasons | 620 (20.5) | 426 (18.6) | 194 (26.4) | <.0001 |

| Reasons | Total N = 3014 | IADL=0 N = 2406 | IADL≥1 N = 608 | P value |
|---|---|---|---|---|
| Could not afford it | 445 (14.8) | 312 (13.0) | 133 (21.9) | <.0001 |
| Could not get an appointment | 476 (15.8) | 377 (15.7) | 99 (16.3) | 0.7108 |
| Office cancellation or rescheduling | 1566 (52.0) | 1290 (53.6) | 276 (45.4) | 0.0003 |
| Decided it could wait | 1016 (33.7) | 831 (34.5) | 185 (30.4) | 0.0554 |
| Afraid to go | 731 (24.3) | 559 (23.2) | 172 (28.3) | 0.0094 |
| Other reasons | 612 (20.3) | 438 (18.2) | 174 (28.6) | <.0001 |

Note. Cell values are raw number and percentage in the parentheses; p values were derived from the Chi-square test.

In the ADL domain, ADL impairment was not associated with delayed care. Delayed care was associated with younger age, female gender, higher education, higher household income, hearing impairment, psychiatric conditions, incontinence, severe fatigue, knowing someone who had died from COVID, greater concerns about the pandemic, perceived financial insecurity, and loneliness. In the IADL domain, IADL impairment was associated with delayed care with OR (95%CI) as 1.43 (1.07, 1.91), together with the same set of aforementioned variables in the ADL model.

The results derived from multiple imputation in separate ADL and IADL domains were quite consistent, as shown in Table 5. Compared to those without ADL or IADL impairment, presence of ADL or IADL impairment was associated with delayed care, with OR (95%CI) as 1.27 (1.12, 1.44) and 1.30 (1.13, 1.49), respectively. The same set of additional explanatory variables was identified in the separate ADL and IADL domains. Sociodemographic characteristics associated with delayed care included younger age, female gender, higher education, and higher household income. Clinical vulnerabilities related to delayed care were psychiatric conditions, urinary incontinence, troubles of pain, and severe fatigue. Note that having a stroke diagnosis reduced the odds of delayed care. Psychosocial factors contributing to delayed care were knowing someone who had died from COVID, concerns about the pandemic, lack of family support, perceived financial insecurity, and loneliness.

### 3.5. Reasons for delayed care by explanatory variable

Reasons for having delayed care by each explanatory variable were listed in the Table 6. Only significant associations were noted in the table. Those who reported greater financial barriers were at a younger age (50–64 years old), with lower education or household income, had ADL/IADL impairment or morbidities such as psychiatric conditions, stroke, fatigue, and pain, perceived financial insecurity, and felt lonely. Those who had higher education or household income, knew someone who had died from COVID, or perceived greater financial security were

**Table 4**

Associations of delayed care in separate ADL and IADL domains (Complete Case Analysis N = 3007).

| Variable | Class | ADL Domain AOR (95%CI) | IADL Domain AOR (95% CI) |
|---|---|---|---|
| ADL impairment (Ref: No) | Yes | Not Included | |
| IADL impairment (Ref: No) | Yes | | 1.43 (1.07, 1.91) |
| Age group (Ref: 50–64) | 65–74 | 2.08 (1.64, 2.64) | 2.14 (1.69, 2.71) |
| | 75+ | 1.65 (1.32, 2.08) | 1.70 (1.35, 2.14) |
| Gender (Ref: Male) | Female | 1.21 (1.01, 1.44) | 1.21 (1.02, 1.45) |
| Education (Ref: less than HS) | HS | 1.35 (0.98, 1.85) | 1.38 (1.01, 1.90) |
| | Some college | 1.58 (1.09, 2.30) | 1.62 (1.11, 2.37) |
| | University and above | 1.62 (1.15, 2.28) | 1.67 (1.19, 2.36) |
| Household income | 2nd Quartile | 1.03 (0.80, 1.34) | 1.05 (0.81, 1.37) |
| | 3rd Quartile | 1.25 (0.97, 1.63) | 1.28 (0.99, 1.66) |
| | 4th Quartile | 1.56 (1.18, 2.04) | 1.60 (1.22, 2.10) |
| Hearing impairment | Yes | 1.27 (1.02, 1.58) | 1.26 (1.01, 1.57) |
| Psychiatric conditions | Yes | 1.41 (1.14, 1.73) | 1.37 (1.11, 1.69) |
| Incontinence | Yes | 1.14 (1.18, 1.70) | 1.40 (1.16, 1.68) |
| Fatigue | Yes | 1.37 (1.08, 1.74) | 1.31 (1.03, 1.67) |
| Knew someone had died from COVID | Yes | 1.29 (1.07, 1.55) | 1.29 (1.07, 1.56) |
| Concerns about pandemic | | 1.04 (1.01, 1.08) | 1.04 (1.01, 1.08) |
| Perceived financial security | | 0.82 (0.74, 0.92) | 0.83 (0.75, 0.93) |
| Loneliness | | 1.36 (1.15, 1.60) | 1.33 (1.13, 1.57) |

Note. AOR= adjusted odds ratio; CI=confidence interval. HS=high school. The reference category for each medical condition is "No".

more likely to report office cancellation and rescheduling as a reason for delayed care, whereas those with ADL/IADL impairment, stroke, or fatigue, or felt lonely were less likely to report such a reason. Those with higher education or household income were more likely to have delayed care because they decided to wait, but those with ADL impairment, fatigue or knowing someone who had died from COVID were less likely to have delayed care due to such a decision. Being female, earning lower household income, having a clinical vulnerability, knowing someone who had died from COVID, having greater concerns about the pandemic, or feeling greater loneliness were associated with increased likelihood to report fear as a barrier to care. Those with more financial security were less likely to report fear as a barrier to access care. Those with lower socioeconomic status, disability, or a chronic condition were more likely to report other reasons for delay in care.

### 4. Discussion

There were marked reductions in outpatient care, emergency room visits, and hospital admissions during the early phase of the pandemic (Giannouchos et al., 2021; Giannouchos et al., 2022; Jeffery et al., 2020; Nguyen et al., 2022; Patel et al., 2021). Reduced access to care may lead to unfavorable outcomes in vulnerable patients, such as medication non-adherence, treatment discontinuity, delayed diagnosis, mental distress, and disability. This study assessed the prevalence of delayed care overall and in specific domains by ADL and IADL functions, identified demographic, clinical, and psychosocial characteristics associated

**Table 5**

Associations of delayed care in separate ADL and IADL domains with multiple imputation ($N = 9919$ from each imputed dataset).

| Variable | Class | ADL Domain AOR (95% CI) | IADL Domain AOR (95% CI) |
|---|---|---|---|
| ADL impairment (Ref: No) | Yes | 1.27 (1.12, 1.44) | |
| IADL impairment (Ref: No) | Yes | | 1.30 (1.13, 1.49) |
| Age group | 65–74 | 1.83 (1.60, 2.09) | 1.85 (1.62, 2.11) |
| (Ref: 50–64) | 75+ | 1.62 (1.42, 1.84) | 1.63 (1.43, 1.86) |
| Gender (Ref: Male) | Female | 1.25 (1.14, 1.38) | 1.25 (1.13, 1.38) |
| Education | HS | 1.16 (1.00, 1.33) | 1.15 (1.00, 1.33) |
| (Ref: less than HS) | Some college | 1.48 (1.24, 1.77) | 1.48 (1.24, 1.77) |
| | University and above | 1.73 (1.47, 2.04) | 1.73 (1.47, 2.04) |
| Household income | 2nd Quartile | 0.93 (0.80, 1.08) | 0.93 (0.81, 1.07) |
| | 3rd Quartile | 1.13 (0.97, 1.31) | 1.13 (0.97, 1.31) |
| | 4th Quartile | 1.27 (1.07, 1.50) | 1.26 (1.07, 1.49) |
| Stroke | Yes | 0.80 (0.67, 0.95) | 0.80 (0.67, 0.95) |
| Psychiatric conditions | Yes | 1.36 (1.21, 1.53) | 1.35 (1.20, 1.51) |
| Incontinence | Yes | 1.46 (1.31, 1.62) | 1.46 (1.32, 1.62) |
| Fatigue | Yes | 1.21 (1.07, 1.37) | 1.20 (1.06, 1.36) |
| Pain | Yes | 1.26 (1.14, 1.39) | 1.28 (1.16, 1.42) |
| Knew someone had died from COVID | Yes | 1.24 (1.12, 1.37) | 1.24 (1.12, 1.37) |
| Concerns about pandemic | | 1.04 (1.02, 1.06) | 1.04 (1.02, 1.06) |
| Perceived financial security | | 0.89 (0.81, 0.97) | 0.89 (0.81, 0.97) |
| Loneliness | | 1.29 (1.14, 1.47) | 1.28 (1.13, 1.46) |
| Family support | | 0.91 (0.84, 0.99) | 0.91 (0.84, 0.98) |

Note. AOR= adjusted odds ratio; CI=confidence interval. NS=not significant. HS=high school. The reference category for each medical condition is "No".

with delayed care, and explored reasons for delayed care during the COVID-19 pandemic in a US sample of community-living older adults (age $\geq$ 50 years). About one-third of the sampled US adults aged 50 years and older reported delayed overall care, and more than one-fifth reported delayed dental care. Not surprisingly, those with ADL /IADL disabilities were more likely to report delayed care overall and in each specific domain, including surgery, doctor visits, dental care, filling prescription drugs, and other, as compared to those without disabilities. Older persons with ADL/IADL impairment were more likely to attribute barriers to care to lack of affordability, fear, and other reasons, but were less likely to be impacted by office cancellation or rescheduling and their own decision to wait, compared to their counterparts without such impairment.

Sociodemographic characteristics such as younger age and higher educational achievement and higher household income were associated with higher odds of delaying care. Clinical vulnerabilities had inconsistent relationship with access to care. Stroke was inversely associated with delayed care, but psychiatric conditions, incontinence, severe fatigue and pain were positively associated with delayed care. Cognitively, knowing someone who had died from COVID and greater concerns

**Table 6**

Reported reasons for delayed care by each predictor of delayed care.

| Variables | Reasons for delayed care Couldn't afford it | Couldn't get an appointment | Office cancellation or rescheduling | Decided it could wait | Afraid to go | Other reasons |
|---|---|---|---|---|---|---|
| Age | Younger age (50–64) | Younger age (50–64) | | | | |
| Gender | | | | | Female | Male |
| Education | Lower education (below university) | | Higher education (some college and university) | Higher education (university) | | Lower education (less than high school) |
| Household income | Lower income (1st and 3rd quartiles) | | Higher income (3rd and 4th quartiles) | Higher income (4th quartile) | Lower income (1st and 2nd quartiles) | Lower income (1st and 2nd quartiles) |
| ADL impairment | + | | – | – | | + |
| IADL impairment | + | | – | | + | + |
| Psychiatric conditions | + | | | | + | |
| Stroke | + | | – | | | |
| Fatigue | + | | – | – | + | + |
| Incontinence | | | | | + | |
| Pain | + | + | | | | + |
| Know someone died from COVID | | | + | – | + | |
| Concerns about pandemic | | – | | | + | |
| Perceived financial security | – | | + | | – | |
| Loneliness | + | | – | | + | |

Note. All variables listed in this table are significant predictors of delayed care from the adjusted models with multiple imputation. Cells that are not empty had a p value <0.05, which was derived from the Chi-square test for categorical variables and independent samples t test for continuous variables. For binary and continuous variables, "+" refers to positive association (more likely to report the reason) and "–" refers to negative association (less likely to report the reason). For nominal variables with $\geq$ 2 categories, the categories listed in each cell were more likely to report each reason compared to those unlisted categories. Family support is not listed in this table because none of the p values were significant.

about the pandemic were associated with delayed care. Other psycho-social factors included perceived financial insecurity, loneliness, and lack of family support. The barriers to care due to financial difficulty and fear were more prevalent among individuals with lower socioeconomic status, having certain clinical vulnerabilities, or experiencing loneliness, whereas barriers to care due to service suspension and reduction were more likely to affect those in higher socioeconomic positions.

To increase hospital capacity of acute care for COVID-related cases and mitigate COVID transmission, healthcare rationing and prioritization inevitably have impacted the patient population at large through temporary facility closure and disruption and cancellation of elective procedures. Patients had to balance the risk of potential COVID infection and the benefits of treatment, while facing the long-standing and pandemic induced barriers to care.

### 4.1. ADL/IADL impairment and delayed care

Delay in care overall and in each domain was more prevalent among individuals with ADL/IADL impairment, compared to those without such impairment. Although some of these services may have been affected by prioritization of care, there was a marked difference in reporting financial barriers to seeking care between the impaired and unimpaired groups. The pre-pandemic literature shows that people with disabilities were less likely to receive recommended care, such as follow-up visits after hospital discharge, care for chronic conditions, preventive medical care, and dental care (Iezzoni, 2011; Na et al., 2017). Their long-lasting barriers to care included financial difficulty, lack of usual source of care, inadequate insurance coverage, transportation, and refusal of services by providers as barriers to care (Chen et al., 2020; Kurichi et al., 2017; McClintock et al., 2017; Spencer et al., 2009). Thus, financial difficulty was a persistent barrier among this population, especially during the pandemic period characterized by increased unemployment and unstable incomes.

On the contrary, reduction and suspension in nonurgent care resulting in office cancellation and rescheduling were more likely to affect individuals without ADL/IADL impairment. They also tended to decide to wait to seek care. The provider and patient factors consistently drove the decision of when to seek care. Care providers decided which cases were urgent and tried to find a balance among shortage in health care resources, risk of COVID-19 infection, and chance for patient survival. The patient self-assessed the benefits of care and the risk of healthcare related COVID-19 infection. Those without ADL and IADL impairment may have more elective procedures subject to cancelation and postponement, whereas those with disability may have needs more likely to be considered medically needed. Since perceptions of what constitutes urgent or needed medical care may vary, healthcare prioritization should be standardized according to evidence-based policies rather than primarily determined by individual physician's assessments and decisions (Giannouchos et al., 2022; Villatoro et al., 2018).

Conversely, a higher proportion of older persons with IADL impairment expressed that they delayed care due to fear. Those with IADL (or ADL) impairment were more likely to be older, with lower socioeconomic status, in poorer self-reported health, and to have a chronic comorbidity. These vulnerabilities predisposed impaired individuals to greater risks of COVID-infection and inadequate resources to combat the disease. A greater percentage of those with ADL/IADL impairment also expressed other reasons for delayed care. Individuals with disability heavily rely on their social network members or paratransit services or other social services for transportation. During the pandemic, especially in the lockdown period, such opportunities dramatically decreased, leaving these individuals at risk for unmet need of medical care. Further research should explore the complex reasons for delaying care in this vulnerable population.

### 4.2. Sociodemographic characteristics associated with delayed care

In the adjusted models, younger age was associated with greater odds of delay in care. Similar findings have been reported in previous research among the US general population (Czeisler et al., 2020) and in specific patient groups such as breast cancer patients (Papautsky et al., 2021). Other contributing factors to delayed care were higher education and household income and being female, all of which were previously identified contributing factors for care avoidance and delay in the general and the nonelderly adult population (Czeisler et al., 2020; Giannouchos et al., 2022; Papautsky et al., 2021). Compared to males, females had a greater tendency to report delay in care, potentially due to their self-reported greater fear. The younger individuals tended to report financial difficulty and appointment unavailability as barriers to care, but those with higher socioeconomic status tended to report appointment cancellation and rescheduling as a barrier. Inadequate insurance coverage (compared to Medicare) for those younger than 65 may contribute to the disparity in access to care. Those in better socioeconomic positions may have more elective procedures and routine checkups subject to being postponed or cancelled, with the consequences of delaying care.

Although perceived financial difficulty and higher socioeconomic status were both associated with delayed care in the adjusted models, there was a difference in the types of care delayed. Financial difficulty and inadequate insurance coverage are long-standing barriers before and during the pandemic. Those who delayed care due to financial reasons were traditionally vulnerable groups affected by lower SES, chronic conditions, social isolation, or ADL/IADL disability. These vulnerable groups were less likely to delay care due to office cancellation or rescheduling than their counterparts. In contrast, those with higher levels of education and in higher income quartiles were more likely to report barriers of office cancellation and rescheduling, a result from prioritization and triage of medical care services as a pandemic response. These findings were consistent with a previous report (Giannouchos et al., 2022).

### 4.3. Clinical characteristics associated with delayed care

Individuals who had a stroke diagnosis were less likely to delay care compared to others. However, less delay of care in these individuals than the pandemic-induced norm was not equivalent to unimpeded access to stroke care: stroke volume decreased about 15% in 2020 in US hospitals compared to 2018 and 2019, potentially due to reallocation of healthcare resources and underutilization of services (Sheng et al., 2021). Conversely, psychiatric conditions increased the risk of delaying care, consistent with previous reports (Ganson et al., 2020; Giannouchos et al., 2022). The COVID-19 pandemic with its continuous psychological, social and economic stressors could potentially increase the prevalence of chronic pain and exacerbate pre-existing pain (Clauw et al., 2020). Patients experiencing troubles of pain may also develop psychiatric comorbidities. However chronic pain unrelated to COVID may be considered as nonurgent during the pandemic, leading to treatment disruption and reduced access to medications. Patients may choose to self-medicate with alcohol or nonmedically prescribed drugs. Indeed, individuals experiencing pain were more likely to report reasons for delayed care as "couldn't get an appointment" and financial barrier. Further investigations should be conducted in patients experiencing troubles of pain to identity the causes and evaluate the consequences of delays in care. Severe fatigue with its underlying conditions such as anxiety, depression, cancer, heart disease, significantly impairs quality of life. Reduction in services for non-urgent care had less impact on these individuals than others, but psychological and financial barriers were primary reasons for their reduced access. Patients with urinary incontinence (UI) were expected to receive inadequate medical attention during the pandemic thus bearing negative consequences on their physical and psychological health and quality of life (López-Fando et al.,

2020). Functional urological surgery has been entirely delayed worldwide, however appropriate surgical care may halt further physiological damage and lessens patients' risk of COVID infection. "Afraid to go" was more likely to be reported in current analysis among individuals with urinary incontinence than others. Pre-pandemic studies reported that isolation, embarrassment, and shame due to UI (Margalith et al., 2004; Siddiqui et al., 2016), fear of surgery (Margalith et al., 2004), and physician communication barriers (Mallett et al., 2018) as impediments to seeking care among urinary incontinence among women in the US. Further examination of care seeking behaviors in this patient group during the pandemic is warranted.

Certain chronic conditions such as cancer, heart disease, diabetes, and sensory impairment did not increase the odds of delay in receipt of care in the adjusted models. These findings should be interpreted in the correct context. Although individuals with these chronic conditions were as likely to have delayed care as their counterparts, delay in care likely posed a greater risk of long-term and irreversible deterioration in health and disability or even mortality for these vulnerable patients than their relatively healthy counterparts. As a matter of fact, delays in primary and specialty care were prevalent during the pandemic, especially in rehabilitation and chronic care, but also in cancer treatment and care for acute cardiovascular diseases (van Weert, 2020). Thus comparing these patients to their healthier counterparts who also delayed care only tells part of the story. Without evaluating the nature and urgency of the delayed cases, we cannot ignore any patient groups at risk for adverse health outcomes due to lack of time-sensitive services.

### 4.4. Cognitive and psychosocial characteristics associated with delayed care

Cognitively, perceived threats from knowing someone who had died from COVID and concerns about the pandemic both contributed to greater odds of delayed care. Fear was one of the top reported reasons that participants delayed care in the current study, replicating the finding in a national survey (Papautsky et al., 2021). Delayed care due to fear was found to be more prevalent in socially and clinically vulnerable groups: being female, financially disadvantaged, socially isolated, or having a certain chronic condition or ADL/IADL disability. Their greater fear was not unfounded. Poorer general health status and weakened immune system could render these individuals more susceptible to COVID and their lack of means to afford subsequent treatment and recovery costs would cause more stress and hardship in life. Fear of contagion and limited contact with the healthcare facilities can be a layer of protection during a pandemic, whereas undue fear despite of critical need may lead to unintended consequences. Thus accurate and transparent information about the coronavirus and instructions on how to safely deliver and receive care should be explicitly communicated to the public, especially those in greater need.

The detrimental effects of loneliness and beneficial impacts of social support on health outcomes are well-known (Courtin & Knapp, 2017; Uchino, 2006). Loneliness arises from a gap between desired and actual level of social connection (Escalante et al., 2021). In this study, loneliness and family support predicted access to care in opposite directions as expected; therefore, both may affect health outcomes directly and indirectly through access to care. This finding informs the healthcare systems on potential ways to alleviate barriers to care for isolated older adults, especially during a pandemic, such as providing personal support (e.g., a volunteer buddy) to these older people, making regular phone calls to inquire about medical needs, and sending personal reminders about medical check-ups.

### 4.5. Implications for policy and practice

Policy makers and healthcare practitioners should give special consideration to the care for vulnerable populations that consistently reported lack of access to needed care over time, such as persons with disabilities or certain chronic conditions, due to their increased chance of experiencing adverse or long-term health consequences from delayed care. Timely receipt of needed care may reduce later utilization of hospital resources and emergency services (Baggio et al., 2021), as the rates of potentially avoidable hospitalizations and emergency department visits are usually higher among underserved individuals with access barriers (Tang et al., 2010; Moy, Chang, & Barrett, 2013). Implementation of measures to minimize pandemic-induced and long-standing access barriers among disparate subpopulations should be considered in alternative care delivery models. Telemedicine and home healthcare services address different access barriers, with the former mitigating transportation needs and infection risk and the latter alleviating demands of physical, sensory, and cognitive competence, Internet access, and equipment in telehealth delivery. Healthcare providers and authorities should make every effort to disseminate to the public accurate information of affordable medical services, care relocations, disease management, and safety measures upon contact with the healthcare systems to ensure access to needed care during a pandemic (DeJong et al., 2021; Giannouchos et al., 2022; Tipirneni et al., 2018).

### 4.6. Limitations

There are several limitations to this study. Although HRS is a nationally representative sample, almost one third of the sample were not asked the questions about delayed care. The results did not infer about causality, but rather associations. Barriers to care such as transportation and social support were not asked in the survey, both of which may critically determine access in periods of lockdown and social distancing maintenance. The measurement of delayed care was by self-report; therefore, the definition of "delay" likely varied for different individuals, and a more consistent objective measure of delayed care is desirable.

## 5. Conclusion

About a third of sampled US adults over age 50 reported delayed care overall during the pandemic. Older individuals with ADL/IADL impairment disproportionately delayed care in general and in specific domains. ADL and IADL impairment, together with demographic, clinical, and psychosocial vulnerabilities, are associated with overall delayed care. It is critical for policy makers to understand the impacts of pandemic-induced and long-standing barriers to care on the healthcare experiences and outcomes in this older population to devise effective health communication messages and equitable healthcare models.

### CRediT authorship contribution statement

**Ling Na:** Conceptualization, Funding acquisition, Methodology, Formal analysis, Writing – original draft, Writing – review & editing.

### Declaration of Competing Interest

I declare no conflict of interest.

**Appendix Table. Distribution of Covariates by IADL Status**

| Variable | class | Total | IADL=0 | IADL>=1 | P-value |
|---|---|---|---|---|---|
| Age group | 50-64 | 6369 (42.3) | 5604 (43.7) | 765 (34.2) | <.0001 |
| | 65-74 | 4481 (29.7) | 3965 (30.9) | 516 (23.1) | |
| | ≥ 75 | 4222 (28.0) | 3265 (25.4) | 957 (42.8) | |
| Gender | Male | 6150 (41.0) | 5365 (42.1) | 785 (35.2) | <.0001 |
| | Female | 8832 (59.0) | 7387 (57.9) | 1445 (64.8) | |
| Married | Yes | 8277 (55.2) | 7357 (57.6) | 920 (41.4) | <.0001 |
| Race/ Ethnicity | Non-Hispanic White | 8428 (56.8) | 7300 (57.8) | 1128 (50.8) | <.0001 |
| | Non-Hispanic Black | 3203 (21.6) | 2628 (20.8) | 575 (25.9) | |
| | Hispanic | 2498 (16.8) | 2087 (16.5) | 411 (18.5) | |
| | Other | 718 (4.8) | 612 (4.8) | 106 (4.8) | |
| Education | Below HS | 2272 (15.1) | 1690 (13.2) | 582 (26.1) | <.0001 |
| | HS graduate | 6860 (45.7) | 5762 (45.1) | 1098 (49.2) | |
| | Some college | 1923 (12.8) | 1674 (13.1) | 249 (11.2) | |
| | University | 3948 (26.3) | 3646 (28.5) | 302 (13.5) | |
| Household income | 1$^{st}$ quartile | 3132 (24.9) | 2329 (21.7) | 803 (43.8) | <.0001 |
| | 2$^{nd}$ quartile | 3146 (25.1) | 2562 (23.9) | 584 (31.8) | |
| | 3$^{rd}$ quartile | 3142 (25.0) | 2833 (26.4) | 309 (16.8) | |
| | 4$^{th}$ quartile | 3137 (25.0) | 2998 (28.0) | 139 (7.6) | |
| Insurance | Yes | 13880 (93.1) | 11783 (92.8) | 2097 (94.9) | 0.0003 |
| Self-rated health | Poor/Fair | 4271 (28.4) | 2836 (22.1) | 1435 (64.2) | <.0001 |
| | Excellent/very good/good | 10783 (71.6) | 9983 (77.9) | 800 (35.8) | |
| Vision impairment | Yes | 3853 (25.7) | 2743 (21.5) | 1110 (50) | <.0001 |
| Hearing impairment | Yes | 2866 (19.1) | 2066 (16.1) | 800 (35.9) | <.0001 |
| Arthritis | Yes | 8984 (59.7) | 7248 (56.6) | 1736 (77.7) | <.0001 |
| High Blood Pressure | Yes | 9438 (62.7) | 7733 (60.3) | 1705 (76.4) | <.0001 |
| Cancer | Yes | 2387 (15.9) | 1939 (15.1) | 448 (20.1) | <.0001 |
| Dementia | Yes | 365 (2.4) | 116 (0.9) | 249 (11.7) | <.0001 |
| Diabetes | Yes | 4230 (28.1) | 3368 (26.3) | 862 (38.6) | <.0001 |
| Heart disease | Yes | 3541 (23.5) | 2647 (20.7) | 894 (40.1) | <.0001 |
| Lung disease | Yes | 1640 (10.9) | 1129 (8.8) | 511 (22.9) | <.0001 |
| Stroke | Yes | 1161 (7.7) | 762 (5.9) | 399 (17.9) | <.0001 |
| Psychiatric conditions | Yes | 3089 (20.5) | 2179 (17.0) | 910 (40.7) | <.0001 |
| Fatigue | Yes | 2669 (17.8) | 1702 (13.3) | 967 (43.7) | <.0001 |
| Incontinence | Yes | 3981 (26.5) | 3000 (23.4) | 981 (44.2) | <.0001 |
| Sleep disorder | Yes | 2531 (16.9) | 1937 (15.2) | 594 (26.7) | <.0001 |
| Pain | Yes | 6093 (40.7) | 4559 (35.8) | 1534 (68.8) | <.0001 |
| Use of opioids | Yes | 1616 (10.8) | 1110 (8.7) | 506 (22.9) | <.0001 |
| Had COVID | No | 9352 (94.8) | 7887 (95.1) | 1465 (93.0) | 0.0027 |
| | Yes | 424 (4.3) | 334 (4.0) | 90 (5.7) | |
| | Not sure | 91 (0.9) | 71 (0.9) | 20 (1.3) | |
| Know someone died from COVID | 1 | 2619 (27.7) | 2239 (28.1) | 380 (25.8) | 0.0679 |
| Concern about pandemic | Mean (SD) | 7.85 (2.66) | 7.86 (2.60) | 7.82 (2.92) | 0.6929 |
| Financial security | Mean (SD) | 3.98 (0.65) | 4.04 (0.83) | 3.56 (0.99) | <.0001 |
| Family support | Mean (SD) | 2.95 (0.87) | 2.96 (0.86) | 2.90 (0.88) | 0.1483 |
| Friend support | Mean (SD) | 3.98 (0.86) | 3.14 (0.73) | 2.98 (0.80) | <.0001 |
| Loneliness | Mean (SD) | 1.52 (0.55) | 1.48 (0.53) | 1.79 (0.62) | <.0001 |
| Personal control | Mean (SD) | 4.92 (1.14) | 5.04 (1.06) | 4.09 (1.32) | <.0001 |

Note. SD refers to standard deviation. For categorical variables, cell values are raw number and percentage in the parentheses; p values were derived from chi-square tests. For continuous variables, cell values are mean and standard deviation in the parentheses; p values were derived from independent samples t tests.

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