



Barriers to healthcare access among U.S. adults with mental health challenges: A population-based study

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ABSTRACT

Background: Having sufficient healthcare access helps individuals proactively manage their health challenges, leading to positive long-term health outcomes. In the U.S., healthcare access is a public health issue as many Americans lack the physical or financial resources to receive the healthcare services they need. Mental healthcare is especially difficult due to lingering social stigmas and scarcity of services. Subsequently, those with mental health impairment tend to be complex patients, which may convolute delivery of services.

Objective: To quantify the prevalence of barriers to healthcare access among U.S. adults with and without mental health challenges (MHC) and evaluate the relationship between MHC and no usual source of care (NUSC).

Methods: A cross-sectional study was conducted with data from the 2017–2018 National Health Interview Survey. MHC was categorized into three levels: no (NPD), moderate (MPD) and severe (SPD) psychological distress. Eight barriers were quantified; one was used as the primary outcome: NUSC. Multivariable logistic regression was used to quantify associations between these characteristics.

Results: The sample included 50,103 adults. Most reported at least one barrier to healthcare access (95.6%) while 13.3% reported NUSC. For each barrier, rates were highest among those with SPD and lowest for those with NPD. However, in the multivariable model, SPD and MPD were not associated with NUSC (OR, 0.92; 95% CI, 0.83–1.01; 0.88; 0.73–1.07). Male sex (1.92; 1.78–2.06), Hispanic race/ethnicity (1.59; 1.42–1.77), and worry to afford emergent (1.38; 1.26–1.50) or normal (1.60; 1.46–1.76) healthcare were associated with NUSC. Having a current partner (0.88; 0.80–0.96), dependent(s) (0.77; 0.70–0.85) and paid sick leave (0.60; 0.56–0.65) were protective.

Conclusions: The most prevalent barriers to healthcare access link to issues with affordability, and MHC exist more often when any barrier is reported. More work is needed to understand the acuity of burden as other social and environmental factors may hold effect.

1. Introduction

Access to healthcare services has a considerable impact on overall health at all stages of life (Gu et al., 2009; Jerant et al., 2012). When healthcare services are sufficiently utilized, this allows for earlier detection and diagnosis of health problems so they may be addressed more proactively (Mesquita-Neto et al., 2020; Papastergiou et al., 2020; Smith & Fader, 2018). This, in turn, results in positive effects on chronic illness and life expectancy (Winkelman et al., 2016; World Health Organization News, 2019). Most healthcare systems around the world

emphasize minimizing barriers to healthcare access for its citizens, but a multitude of barriers systematically complicate such an objective (Agency for Healthcare Research and Quality, 2019; Corscadden et al., 2018). A few notable barriers involve services being inadequately approachable, physically available or affordable (Levesque et al., 2013).

To add further complication, “access” has not been conceptualized with uniformity within or across health systems, which often directs policy without considering all relevant issues (Oliver & Mossialos, 2004). In reality, access revolves around a spectrum of characteristics, all of which require consideration to adequately determine one’s level of

Abbreviations: MHC, Mental health challenges; NUSC, No usual source of care.

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access. This involves interface between characteristics of individuals, households, and social and physical environments with characteristics of health systems, organizations, and healthcare providers. It encapsulates both supply- and demand-features with the ultimate objective to have healthcare needs fulfilled. A conceptual framework by Levesque and colleagues synthesized each of these characteristics and define access as “the opportunity to identify healthcare needs, to seek healthcare services, to reach, to obtain or use health care services, and to actually have the need for services fulfilled” (Levesque et al., 2013). This framework composites five dimensions of accessibility: approachability (the ability to perceive), availability (the ability to reach), affordability (the ability to pay), acceptability (the ability to seek) and appropriateness (the ability to engage).

Revisions are frequently made to health policy to improve healthcare access. Most recently in the United States, the 2010 Affordable Care Act (ACA) was enacted with the intent to improve access and quality of healthcare services for U.S. citizens. Over the next decade, the ACA expanded Medicaid eligibility to persons earning up to 138% of the federal poverty level, which marked the largest expansion of coverage to non-elderly adults in over fifty years. As of June 2021, 38 U.S. states and the District of Columbia have either moved forward with expansion or are in the process of implementation (Kaiser Family Foundation, 2020).

In the years following Medicaid expansion, levels of healthcare access showed remarkable improvements. States that expanded reported reduced out-of-pocket spending, fewer skipped medications and increased utilization of healthcare services (Sommers et al., 2016). Collectively, rates of those with health insurance coverage and a usual source of care increased while concerns of barriers to healthcare access decreased (McMorrow et al., 2017; Schmittiel et al., 2018). These improvements were found at most levels of age, sex, socioeconomic status, and among those with a disability or pre-existing condition (Daw and Sommers, 2019; Hill & Hyde, 2020). Noteworthy improvements were shown in affordability, but there remains issues with longer wait times, scheduling conflicts and transportation (Alcala et al., 2018; Miller and Wherry, 2017).

The ACA did not affect all persons equally. Certain vulnerable populations, like those with mental health challenges (MHC), remain disproportionately susceptible to barriers to healthcare access. One study found increasing levels of psychological distress, a proxy measure of MHC, associated with an increased rate of forgoing medical care due to cost, although this rate has decreased in recent years (Dedania & Gonzales, 2019; Fry and Sommers, 2018). In a sample of emergency department patients, one study found a three-fold increase in the total number of perceived barriers reported from those positively screened for depression and anxiety (Abar et al., 2017). Persons with MHC face a range of multifaceted complications when navigating healthcare services as evidenced by increased risk of the onset, persistence and severity of a wide range of physical disorders, which may convolute the delivery of mental healthcare (Ortega et al., 2006). Additionally, persons with MHC contend with perceptions of stigma amongst healthcare professionals, making it difficult to navigate healthcare systems (Knaak et al., 2017; Vistorte et al., 2018; Thornicroft et al., 2007). Stigma continues to play an influential role in affecting patient perception and in some cases creates moral injury, either introducing or exacerbating MHC (Brondani et al., 2017). A large multi-country comparison found the U.S. has a wider gap in healthcare access barriers between persons with and without MHC than several other countries (Corcadden et al., 2018). The investigators who conducted the aforementioned study adopted Levesque’s framework and mapped dozens of characteristics to each dimension of healthcare access, one of the few studies to aggregately evaluate all five dimensions, rather than a predetermined subset of dimensions, in the same population.

Post-ACA reforms, approximately one-fifth of U.S. adults with MHC still lack a usual source of care, and more than half report affordability-related barriers to accessing healthcare (Sherrill & Gonzales, 2017; Thomas et al., 2018). Despite improvements made, the cost of

healthcare in the U.S. continues to rise, un- and under insurance rates remain elevated, and there is speculation that improvements will be negated if the ACA is repealed in the future (Lorenzoni et al., 2019; Winkelman et al., 2016). As challenges to healthcare access persist, research efforts must be made to observe the magnitude of effect healthcare access disparities have on populations who experience a range of MHC. The aims of this study were two-fold: quantify the prevalence of barriers to healthcare access among U.S. adults with and without MHC, and evaluate the relationship between the presence of MHC with not having a usual source of care (NUSC) while adjusting for demographic and lifestyle characteristics as well as other barriers to healthcare access.

2. Material and methods

2.1. Study design

We employed a cross-sectional study design with data from the 2017–2018 National Health Interview Survey (NHIS), choosing the two most recent consecutive years of data because a new sampling design was implemented in 2016. NHIS is a principal source of information on the health of the civilian noninstitutionalized population of the U.S., overseen by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (National Center for Health Statistics, 2020). The in-person survey is administered annually to approximately 35,000 households across the U.S. and records basic demographic, health, and disability information for each household member. One random adult in each household is then selected for a detailed interview on more specific health information, which includes mental health status and healthcare access; we used these interviews to composite our study sample.

2.2. Mental health challenges (MHC)

MHC was treated as the primary independent variable of interest for this study and the classification of “mental health challenges” was purposeful. Mental health issues can occur along a wide spectrum and include formal illness/diagnostic disease but also comprise problems related to moral injury and distress. Additionally, there is current precedent to support the use of “mental health challenges” when describing a variety of mental health related problems in populations who experience inadequate access to healthcare (Wang et al., 2020). For our study, we defined MHC using the 6-item Kessler Psychological Distress Scale (K6), which was developed with support from the NCHS for its specific use in the NHIS (Kessler et al., 2003). The K6 measures non-specific psychological distress over the 30-day period prior to interview by assessing the frequency with which participants experienced feelings of sadness, nervousness, restlessness, hopelessness, worthlessness and everything being an effort. Validation of the K6 confirmed the measure’s sensitivity around the threshold for the clinically significant range of the distribution of psychological distress, which expanded use and analysis of the K6 into three levels. Scores range from 0 to 24; scores ≤ 4 were classified as having no psychological distress (NPD), scores 5–12 were classified as having moderate psychological distress (MPD), and scores ≥ 13 were classified as having severe psychological distress (SPD) (Prochaska et al., 2012).

2.3. Conceptual framework

We adopted Levesque’s conceptual framework to synthesize the variety of healthcare access-related question items used in the NHIS. Upon reviewing survey content, we selected only items that inquired on a general function of access, that is, a barrier to healthcare access that may have potential impact on any U.S. adult. A participant’s ‘inability to afford prescription medication,’ for example, was an item that we did not use as it limits the population of respondents to those who are or

have been prescribed pharmacological forms of treatment. A total of eight question items were selected as shown in Table 1. One item linked to the dimension of Approachability, five items to Availability and two items to Affordability.

2.4. No usual source of care

The selection of these items directed the methodological construction for how to best analyze barriers to healthcare access for our study. Through synthesis of the literature, we found studies that investigated determinants of healthcare access used a variety of self-reported indicators, and among the items we selected, one seemed to appear most frequently: whether an individual has a usual source of care when they are sick or need advice about their health (Item 1) (Brown et al., 2010; Choi, 2011; Gonzales et al., 2019; Farietta et al., 2018; Jones et al., 2014; Pullen et al., 2014; Sherrill & Gonzales, 2017). In some cases, this question item was used exclusively and acknowledged as one of the most protective factors to accessing healthcare services for any standard or emergent medical need as the perennial starting point to ensure all U.S. citizens have a medical home (Blewett et al., 2008; Jerant et al., 2012; Manuel, 2017). For these reasons, not having a usual source of care was used as the primary outcome for this study, which we abbreviated as NUSC. NHIS participants who reported “Yes” or “There is more than one place” to this question were classified as having a usual source of care. Those who answered “There is no place” were classified as NUSC and, subsequently, have the approachability-related barrier to care (Approachability: relates to that fact that people facing health needs can actually identify that some form of services exist and have an impact on one’s health).

2.5. Other indicators of barriers to healthcare access

As noted earlier, ‘access’ is a multi-dimensional concept and although we designated NUSC as our primary outcome measure of healthcare access, we were interested in exploring a range of other barriers as well because a consensus in the literature suggests that a variety of factors may influence one’s level of access. Items 2 through 8 in Table 1 highlight specific characteristics of access as they relate to availability (the ability to reach healthcare services both physically and in a timely manner) and affordability (the economic capacity for people to spend resources without catastrophic expenditure to compromise access for basic necessities). The phrasing of these items enabled their temporal relationship with NUSC to be fluid, even though approachability (as measured by NUSC) is acknowledged as the initial stage of achieving access. Issues with wait time (Item 4) or worry affording normal healthcare services (Item 8), for instance, may both occur as either a cause or result from lacking a usual source of care. Additionally, these question items and the dimensions they represent are infrequently measured alongside approachability-related barriers in health services

Table 1
NHIS question items used to measure healthcare access.

NHIS question	Dimension
1. Is there a place that you USUALLY go to when you are sick or need advice about your health?	Approachability
Have you delayed getting care for any of the following reasons in the past 12 months?	–
2. You couldn’t get through on the telephone.	Availability
3. You couldn’t get an appointment soon enough.	Availability
4. Once you get there, you have to wait too long to see the doctor.	Availability
5. The clinic/doctor’s office wasn’t open when you could get there.	Availability
6. You didn’t have transportation.	Availability
7. If you get sick or have an accident, how worried are you that you will be able to pay your medical bills?	Affordability
8. How worried are you right now about not being able to pay medical costs for normal healthcare?	Affordability

research. For these reasons, we decided to employ them as independent variables in our study, allowing us to adjust for the effect of availability- and affordability-related barriers when investigating the relationship between MHC and NUSC. Participants who reported “Yes” to Items 2 through 6 were classified as having that respective availability-related barrier to care and those who answered “No” were not. Participants who reported “Very worried” or “Somewhat worried” to Items 7 and 8 were classified as having that respective affordability-related barrier to care and those who answered “Not at all worried” were not. No items from the NHIS were linked to the acceptability or appropriateness dimensions (the ability to seek; the ability to engage) which consider a) the social and cultural factors that determine the possibility for a patient to accept aspects of the services for which they are to receive and b) the fit between those services and the patient’s specific healthcare needs, respectively (Levesque et al., 2013).

2.6. Statistical analysis

Descriptive statistics were used to characterize the study sample, and binary logistic regression analyses were used to explore the relationship between MHC and NUSC. To control for confounding and more thoroughly understand other factors among U.S. adults that are associated with NUSC, models adjusted for demographic characteristics [age (18–25, 26–34, 34–49, 50–64, 85+), sex (male, female) and race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Non-Hispanic other races, Hispanic)], lifestyle characteristics [current partner (yes: ‘Married – spouse in household’, ‘Married – spouse not in household’, ‘Married – spouse in household unknown’, ‘Living with partner’; no: ‘Widowed’, ‘Divorced’, ‘Separated’, ‘Never married’), at least one dependent living at home (yes: ‘Yes, the Sample Adult is a parent of a child residing in the family’, ‘There are minor children residing in the family but the Sample Adult is not their parent’, no: ‘There are no minor children residing in the family’), current source of income (yes: ‘Working for pay at a job or business’, ‘With a job or business but not at work’; no: ‘Looking for work’, ‘Working not for pay at a family-owned job or business’, ‘Not working at a job or business and not looking for work’), working multiple jobs (yes, no) and paid sick leave at a current or most recent job (yes, no)], and other barriers to healthcare access (Items 2–8 from Table 1 as defined in section 2.5). Additionally, we used a Chi-square test to analyze the association between MHC and each barrier to healthcare access (Items 1–8). We followed up this test with the Cramer’s V strength statistic, the most common strength test used when a Chi-square test produces a significant test statistic and is particularly useful when said statistic is suspected to result from a large sample size (McHugh, 2013). Analyses were conducted in SAS version 9.4 (SAS Institute, Cary, NC). All reported results incorporated NHIS provided survey weights and accounted for the complex survey design. Results were presented by a stepwise inclusion of variables from the unadjusted model containing only the main independent variable of interest (MHC, as measured by psychological distress: NPD, MPD, and SPD) then adjusting for demographic, lifestyle, and healthcare access barrier variables separately. Model adequacy was evaluated with the max-rescaled R-Squared statistic and the receiving operating characteristic (ROC) curve.

3. Results

A total of 52,159 U.S. adults participated in the 2017 and 2018 NHIS. We excluded 2,056 participants who did not report complete information on mental health status or healthcare access or those who had a physical or mental condition that prohibited their ability to respond and did not have a knowledgeable proxy. After meeting exclusion criteria, our study sample consisted of 50,103 participants. Based on responses to the K6, 37,895 (76.0%) participants were classified as having NPD, 10,324 (20.4%) were classified as having MPD and 1,884 (3.6%) were classified as having SPD. The majority of participants were female

(51.6%), White (78.2%) and Non-Hispanic (83.8%) with a mean age of 47.4 years (±0.10 S.E.). Over 60% reported having a current partner and close to one-quarter had at least one dependent living in their home at the time of completing the survey. More details are included in Table 2.

Approximately 13.3% (n = 6,060) of participants reported NUSC with comparable rates at each level of psychological distress (SPD: 14.4%, MPD: 14.1%, NPD: 13.0%). The average number of self-reported barriers to healthcare access by participants was 1.8. Most reported having at least one barrier (95.6%), the most prevalent being Item 7 (worried one would be able to pay medical bills if they were to get sick or have an accident). For all availability- and affordability-related barriers, rates were highest among participants with SPD and lowest among participants with NPD as shown in Table 3. Although each chi-square test produced a significant result, the most substantive relationships between MHC and barriers to healthcare access were shown for Items 7 and 8, the affordability-related barriers (Cramer's V: 0.19, 0.22, respectively).

A complete list of results from the logistic regression models is

Table 2

Descriptive statistics of 2017–2018 NHIS participants by those who reported having and not having a usual source of care.

Variable	All (n = 50,103)	Have a usual source of care (n = 44,043)	Do not have a usual source of care (n = 6,060)
Demographic			
Mean ± S.E. age, year	47.4 ± 0.10	49.0 ± 0.11	37.3 ± 0.22
Female, no. (%)	27,350 (51.6)	24,932 (53.8)	2,418 (37.6)
Race, no. (%)			
White	40,124 (78.2)	35,384 (78.4)	4,740 (76.5)
Black/African American	5,651 (12.2)	4,973 (12.2)	678 (12.4)
American Indian/Alaska Native	573 (1.2)	513 (1.2)	60 (1.1)
Asian	2,599 (6.3)	2,216 (6.2)	383 (6.5)
Multiple races	1,045 (2.1)	865 (1.9)	180 (3.5)
Ethnicity, no. (%)			
Hispanic	6,191 (16.2)	4,915 (14.6)	1,276 (26.7)
Non-Hispanic	43,912 (83.8)	39,128 (85.4)	4,784 (73.3)
Lifestyle			
Marital Status: Partner, no. (%)	25,434 (60.3)	22,802 (61.6)	2,632 (52.2)
Dependent(s) in home, no. (%)	11,500 (27.2)	9,969 (26.9)	1,531 (28.9)
Employment status in the last week			
Working for pay at a job or business	27,784 (60.2)	23,552 (58.4)	4,232 (71.3)
With a job or business but not at work	1,111 (2.2)	963 (2.2)	148 (2.2)
Looking for work	1,423 (3.3)	1,092 (2.8)	331 (6.3)
Working not for pay at a family-owned job or business	447 (0.8)	393 (0.8)	54 (0.8)
Not working at a job or business and not looking for work	19,321 (33.5)	18,032 (35.7)	1,289 (19.3)
Have more than one job, no. (%)	2,882 (6.0)	2,423 (5.8)	459 (7.4)
Have paid sick leave at current or most recent job, no. (%)	27,833 (54.6)	25,304 (56.7)	2,529 (40.9)

Note: Weighted means and percentages are reported; S.E. = standard error; no. = number; Race was not obtained for 111 participants; Current employment was not obtained for 17 participants.

Table 3

Barriers to healthcare access across all levels of psychological distress.

Dimension	Item	All (n = 50,103)	SPD (n = 1,884)	MPD (n = 10,324)	NPD (n = 37,895)
Approachability	Not having a place that you usually go to when you are sick or need advice about your health, no. (%)	6,060 (13.3)	252 (14.4)	1,336 (14.1)	4,472 (13.0)
Availability	Delayed getting medical care in past 12 months because ...				
	You couldn't get through on the telephone, no. (%)	1,529 (3.0)	197 (10.6)	582 (5.6)	750 (1.9)
	You couldn't get an appointment soon enough, no. (%)	3,798 (7.5)	390 (19.9)	1,340 (13.0)	2,068 (5.4)
	Once you get there, you have to wait too long to see the doctor, no. (%)	2,287 (4.6)	257 (13.8)	752 (7.3)	1,278 (3.5)
Affordability	The clinic/doctor's office wasn't open when you could get there, no. (%)	1,776 (3.5)	215 (10.9)	671 (6.4)	890 (2.4)
	You didn't have transportation, no. (%)	1,231 (2.1)	265 (12.0)	515 (4.0)	451 (1.1)
	Very worried or somewhat worried of being ...				
	Able to pay medical bills if you get sick or have an accident, no. (%)	21,268 (44.1)	1,275 (68.3)	5,922 (59.3)	14,071 (38.9)
Total	Able to pay medical costs for normal healthcare, no. (%)	12,784 (27.0)	1,137 (61.3)	4,053 (40.6)	7,594 (21.7)
	Total Number of Self-Reported Barriers to Healthcare Access, mean	1.8	2.8	2.2	1.6

Note: Weighted means and percentages are reported; NPD = No Psychological Distress, MPD = Moderate Psychological Distress, SPD = Severe Psychological Distress; All eight barriers produced a Chi-square test result of P ≤ 0.01.

included in Table 4 beginning with the unadjusted model (Model #1), then controlling for demographic (Model #2), lifestyle (Model #3 & Model #4, personal and employment characteristics added separately), availability-related (Model #5) and affordability-related (Model #6) variables. In the final multivariable model where all variables were controlled for (Model #6), male sex, Hispanic race/ethnicity, no partner, no dependent(s), no paid sick leave from a current or recent job, having a source of income, and worried one is able to pay for both a) medical bills if they get sick or have an accident and b) medical costs for normal healthcare were all significantly associated with NUSC. The primary independent variable (psychological distress) was not significant in neither the unadjusted (Model #1) nor final model (Model #6). Compared to their designated reference groups, male sex (OR, 1.92; 95%

Table 4
Regression results for not having a usual source of care for NHIS participants.

Variable	Model #1	Model #2	Model #3	Model #4	Model #5	Model #6
Psychological Distress						
NPD	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
MPD	1.10 (1.01, 1.19)*	1.07 (0.98, 1.17)	1.05 (0.96, 1.15)	1.03 (0.94, 1.13)	1.05 (0.96, 1.15)	0.92 (0.83, 1.01)
SPD	1.13 (0.94, 1.35)	1.19 (0.99, 1.43)	1.11 (0.92, 1.34)	1.07 (0.88, 1.30)	1.12 (0.93, 1.37)	0.88 (0.73, 1.07)
Sex						
Female		1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Male		1.93 (1.79, 2.07)**	1.89 (1.75, 2.03)**	1.87 (1.74, 2.01)**	1.86 (1.73, 2.00)**	1.92 (1.78, 2.06)**
Age						
18–25		1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
26–34		1.05 (0.95, 1.16)	1.20 (1.07, 1.34)**	1.34 (1.20, 1.51)**	1.35 (1.21, 1.52)**	1.26 (1.12, 1.41)**
35–49		0.53 (0.47, 0.60)**	0.64 (0.57, 0.73)**	0.72 (0.63, 0.82)**	0.72 (0.63, 0.82)**	0.63 (0.56, 0.73)**
50–64		0.33 (0.29, 0.37)**	0.36 (0.31, 0.40)**	0.40 (0.35, 0.46)**	0.41 (0.36, 0.46)**	0.35 (0.31, 0.40)**
65–84		0.14 (0.12, 0.16)**	0.14 (0.12, 0.17)**	0.18 (0.15, 0.21)**	0.18 (0.16, 0.21)**	0.18 (0.15, 0.20)**
85+		0.07 (0.05, 0.11)**	0.07 (0.05, 0.11)**	0.09 (0.07, 0.14)**	0.09 (0.07, 0.14)**	0.10 (0.07, 0.14)**
Race/Ethnicity						
Non-Hispanic White		1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Non-Hispanic Black		1.08 (0.95, 1.24)	1.04 (0.91, 1.20)	1.06 (0.92, 1.21)	1.06 (0.92, 1.21)	0.99 (0.86, 1.13)
Non-Hispanic Other		1.17 (1.02, 1.35)*	1.16 (1.01, 1.34)*	1.16 (1.01, 1.34)*	1.17 (1.02, 1.35)*	1.15 (1.00, 1.32)*
Hispanic		1.82 (1.63, 2.03)**	1.84 (1.65, 2.06)**	1.81 (1.62, 2.02)**	1.82 (1.62, 2.03)**	1.59 (1.42, 1.77)**
Lifestyle Characteristics						
Current Partner			0.86 (0.79, 0.94)**	0.88 (0.81, 0.97)**	0.88 (0.81, 0.97)**	0.88 (0.80, 0.96)**
Dependent(s)			0.80 (0.73, 0.88)**	0.79 (0.71, 0.87)**	0.78 (0.71, 0.86)**	0.77 (0.70, 0.85)**
Current source of income				1.25 (1.14, 1.38)**	1.25 (1.13, 1.38)**	1.21 (1.10, 1.33)**
Multiple jobs				1.04 (0.91, 1.20)**	1.05 (0.91, 1.20)**	1.04 (0.91, 1.20)**
Paid sick leave				0.56 (0.51, 0.60)**	0.56 (0.51, 0.60)**	0.60 (0.56, 0.65)**
Availability-related barriers, Delayed care because ...						
You couldn't get through on the telephone.					1.01 (0.79, 1.29)	0.96 (0.75, 1.23)
You couldn't get an appointment soon enough.					0.70 (0.59, 0.83)**	0.67 (0.56, 0.80)**
Once you get there, you have to wait too long to see the doctor.					0.99 (0.82, 1.18)	0.92 (0.76, 1.10)
The clinic/doctor's office wasn't open when you could get there.					1.10 (0.90, 1.35)	1.05 (0.85, 1.29)
You didn't have transportation.					0.90 (0.70, 1.15)	0.86 (0.67, 1.11)
Affordability-related barriers, being worried ...						
You are able to pay your medical bills if you get sick or have an accident						1.38 (1.26, 1.50)**
You are able to pay medical costs for normal healthcare						1.60 (1.46, 1.76)**

Note: Results are displayed by the following: OR (lower 95% CI, upper 95% CI), OR = Odds Ratio, CI = Confidence Interval. NPD = No Psychological Distress, MPD = Moderate Psychological Distress, SPD = Severe Psychological Distress, *P ≤ 0.05, **P ≤ 0.01.

CI, 1.78–2.06, vs. females) and Hispanic persons (OR, 1.59; 95% CI, 1.42–1.77, vs. Non-Hispanic White) were associated with NUSC. Those with paid sick leave were 40% less likely to have NUSC (OR, 0.60; 95% CI, 0.56–0.65, vs. those without paid sick leave) while at least some worry of affording emergent (OR, 1.38; 95% CI, 1.26–1.50, vs. no worry) or normal medical costs (OR, 1.60; 95% CI, 1.46–1.76, vs. no worry) increased risk. A suggestive dose response was found between age brackets. Compared to persons ages 18–25 years, all age groups older than 35 reported having a lower risk of NUSC with the strongest protective effect reported in the oldest age group (85+). None of the five availability-related barriers were associated with an increased risk of NUSC. The final model (Model #6) explained 15.9% of the overall variance, with the area under the ROC curve (0.75) indicating a fair level of discrimination.

4. Discussion

Our descriptive results highlighted increased self-reported barriers to accessing healthcare services across dimensions of approachability, availability and affordability among individuals with MHC compared to individuals without MHC. In multivariable models, we identified several determinants of NUSC independent from MHC. Many significant findings were consistent with that of previous studies, namely identifying lower rates of usual source of care among males, younger adults and Hispanic persons (Choi, 2011; Manuel, 2017; Singh & Wilk, 2019). Having a usual source of care is likely associated with one's perceived level of need and desire of services, of which older persons are likely to have. The effect found in Hispanic persons signals continued disparities in healthcare access for minority ethnic populations (Rangel Gomez et al., 2019). In addition, those without employer-provided benefits of

paid sick leave were disproportionately impacted by reduced healthcare access; this is evident in their increased risk of NUSC, foregoing medical care for themselves or their family, and continuing to attend work when ill (Derigne et al., 2016). In times of a pandemic due to the 2019 novel coronavirus (SARS-CoV-2; COVID-19), this relationship is particularly disconcerting and may be exacerbated. Future studies should illustrate that this propensity to work while ill has hindered efforts to mitigate the spread of coronavirus in the U.S.

Although the main effect of MHC was not statistically significant in multivariable models, its direction shifted when considering the two affordability-related barriers to care. Issues affording normal healthcare and unanticipated medical bills remained significant signifying that one's mental health status does not impede on the consistent burden of affordability when accessing healthcare services. On the contrary, only one of the availability-related barriers produced a significant effect, which may have been attributed to lower prevalence rates. The most common barrier (Item 7) was reported over three times more than the primary outcome (NUSC) and over five times more than the most frequently reported availability-related barrier (Item 3: couldn't get an appointment soon enough). In any case, the elevated prevalence estimates of affordability-related barriers to care suggest that certain dimensions of healthcare access may be more impactful than others when considering a generalizable population of non-institutionalized U.S. adults. It may also be suspected that barriers within or across different dimensions affect one another. For instance, if one worries about affording normal medical costs, they may likely be concerned about cost should they get sick or have an accident, and general concerns related to cost may also interfere with the ability to physically make it to services as taking off work and dealing with long wait times, for example, may prove more burdensome.

However, the true prevalence of availability-related barriers may be better understood when considering geographic determinants, such as urban-rural classification. With a disproportionate allocation of healthcare resources spread out over larger physical areas for rural inhabitants, it may be assumed that those living in those regions of the U.S. face more burden with travel distances and time, a concern that has already produced a rural-based federal initiative to serve counterpart to recognizing national health objectives in the general population (Bolin et al., 2015). Our study ascertained data from publicly-available NHIS records, which do not include information on participants' geographic characteristics. Thus, geographic determinants of healthcare access were not explored.

Using NHIS data, we were able to examine three dimensions of healthcare access: approachability, availability, and affordability. However, we were not able to study acceptability and appropriateness, which are the ability to seek and engage in healthcare services, respectively. No NHIS question items linked to these dimensions as they are not traditionally captured through quantitatively driven data collection mechanisms. Occasionally in research, stigma serves as a comparable indicator for these dimensions. One study that examined factors associated with difficulty in receiving medical care among a sample of adults with mental illness found its comorbid existence with a chronic physical health condition posed additional challenges (Ostrow et al., 2014). The implications this has on healthcare access link to several considerations. First, it is suspected that healthcare providers are often influenced by the perceived stigma objectified by the patients they serve. Navigating the U.S. healthcare system requires an informative and authoritative approach, which places a great deal of responsibility on the patient. Those who lack empowerment in these areas, which may include those with MHC, are met with a disadvantage. Second, evidence suggests that a majority of persons who seek mental healthcare services in the U.S. do so through a general practitioner rather than one who specializes in mental health treatment. This demands healthcare providers to expand their services across mental and physical health issues, of which some generalists are not properly trained and equipped to effectively address more serious mental health issues and complications.

It is particularly in rural areas that providers have become make-shift mental healthcare specialists out of the necessity for treating the geographic population (Chipp et al., 2011; Cunningham, 2009). It is due to these missing resources that rural healthcare organizations can be further burdened by the needs of their populations. Third, fewer than half of those in need of mental healthcare actually seek out services (National Alliance on Mental Illness, 2019). This casts an additional layer of complication over the representativeness of MHC on U.S. citizens and how best to treat. For this reason, this study was methodical in capturing MHC broadly by including those who both have and have not navigated the U.S.'s healthcare system. This population is both larger and more representative of true mental health impairment on U.S. adults. Follow up research efforts should aim to include these more abstract dimensions through qualitative or mixed approaches as to gain a more complete understanding of healthcare access barriers among persons with MHC.

We believe it is important to address the study's limitations. First and foremost, the cross-sectional design of the study prevents any ability to infer temporality or causality with characteristics associated with persons lacking a usual source of care. We also recognize that our multi-dimensional approach to investigate healthcare access does not definitely measure one's true level of access. In conjunction with the three dimensions and eight barriers explored, there are many other factors that influence the identification, reachability, utilization and fulfillment of healthcare services. The NHIS survey used, although incredibly comprehensive, does not come without its own limitations. The NHIS omits institutionalized individuals, thus missing such segments of the population as military personnel or older adults in nursing homes and other long-term care facilities. The annual survey sample for each year, because of the cross-sectional design, represents a changing cohort of subjects, although this concern is mitigated with only two consecutive years used over the same sampling design period (Backinger et al., 2008). We must also acknowledge the limitations inherent with self-reported data, as this may influence participants willingness to report undesirable feelings of psychological distress. If so, the effects shown in this study may be attenuated. Finally, we must consider the changing landscape to healthcare systems that resulted from the COVID-19 pandemic, preceded by the time period of the data used for this study. Systems throughout the U.S. have modified practices to mitigate face-to-face encounters by providing telehealth as a more widespread modality. For this reason, future studies should consider the impact of COVID-19, and subsequent adjustments to healthcare delivery, when evaluating healthcare access. Although tele-mental health may become more common, future research efforts must still evaluate all dimensions of healthcare access to ensure comprehensive recovery for future generations.

5. Conclusion

The most prevalent barriers to healthcare access link to issues with affordability, and MHC exist more often when any barrier to healthcare access is reported. Ideally, all five dimensions of healthcare access should be considered when evaluating healthcare systems, particularly when studying complex populations with unique health challenges. It is important not to undermine the influence this has on persons with MHC or how having MHC impacts the maneuvering of such challenges. In doing so, public policy may be directed from more complete framing of the issues at hand.

This study emphasizes the need to continue monitoring disparities of healthcare access among persons experiencing MHC. More work is needed to understand the acuity of mental health burden on U.S. adults as other social and environmental factors may be of importance.

Ethical statement

Authorship of the paper: CRediT authorship contribution statement

Nicholas C. Coombs: Conceptualization, Methodology, Software, Formal analysis, Writing – original draft, Writing – review & editing. **Wyatt E Meriwether:** Writing – review & editing, Supervision, the views and opinions expressed in this article are the authors' and do not express the views of the Department of Veterans Affairs or the federal government. **James Caringi:** Writing – review & editing, Supervision, first author's advisory chair. **Sophia R. Newcomer:** Methodology, Software, Writing – review & editing, Supervision.

Originality and plagiarism

We ensure that this manuscript is an entirely original work. All work and/or words of others have been appropriately cited.

Data access and retention

We have provided the raw data and analytic code in our supplemental materials.

Multiple, redundant or concurrent publication

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

Disclosure and conflicts of interest

None.

Declarations of interest

None.

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