AN INVESTIGATION OF RURAL AND MENTAL HEALTH DISPARITIES ACROSS FIVE DIMENSIONS OF HEALTHCARE ACCESS

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AN INVESTIGATION OF RURAL AND MENTAL HEALTH DISPARITIES ACROSS FIVE DIMENSIONS OF HEALTHCARE ACCESS

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Dissertation

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Access to healthcare is a complicated public health challenge. Healthcare access is multi-dimensional and combines characteristics of individuals, their households, and their social and physical environments with system-level characteristics of healthcare delivery systems, organizations and healthcare providers. Access encompasses five dimensions: approachability, acceptability, availability, affordability and appropriateness. This dissertation investigates these five dimensions of access to healthcare in the context of two populations of interest: 1) persons who reside in rural areas and 2) persons who experience mental health challenges. Both persons in rural areas and persons with mental health challenges have structural barriers to healthcare access. Additionally, rural health and mental health are complex characteristics as there are many levels of rurality and multiple diagnosable mental illnesses. To address these considerations, this dissertation was comprised of three studies. The first study quantified barriers to healthcare access among US adults with and without mental health challenges. A cross-sectional study design was employed using data from the 2017-2018 National Health Interview Survey. This study focused on three of the dimensions of access: approachability, availability and affordability. The other two studies investigated rural and mental health-specific challenges in Montana, a region of the US at the intersection of structural barriers for both rural health and mental health. The majority of Montana counties are classified as rural, and several mental health indicators among persons in Montana are two-fold the comparable national averages. Next, a qualitative study of Montana healthcare providers was used to identify social, cultural and programmatic barriers to healthcare access among persons who reside in Montana. This study focused on two of the dimensions of access, acceptability and appropriateness, that are often less understood and harder to quantify. The third study employed an ecological study design utilizing three data sources: a regional health workforce information services company that maintains up-to-date provider data, the Montana Department of Health and Human Services and the American Community Survey. This study tested a relationship between the density of healthcare provider per capita and suicide across Montana counties. Together, the results from these three studies suggest the following: across the US, affordability-related barriers to healthcare access continue to be a pressing concern among most Americans, and mental health challenges may associate with more barriers to healthcare access. In Montana, a friction exists between aspects of patients’ rural identities and healthcare systems, and communication within Montana’s healthcare systems is fragmented. Conjointly, these findings suggest one overarching implication. Disparities in access to healthcare at the individual-level compound with disparities in access to healthcare at the system-level, just as they do within the context of rural health and mental health. In order to effectively address disparities in access to healthcare in the US, the individual and the system must both be carefully considered.
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Chapter 1: Overview

Access to healthcare has been regarded as a growing public health challenge in the United States for decades (Riley, 2012). One in five Americans do not have a usual source of care when sick or in need of health advice, and close to half would be burdened by an unexpected medical bill (Farietta, Lu & Tumin, 2018; National Alliance on Mental Illness, 2017; Sommers et al., 2016). These statistics reference the total US population, but many structural barriers to healthcare access uniquely impact certain sub-populations within the US. One population of note is those who reside in rural areas. People living in rural areas have lower average household income and higher rates of un- or under-insurance compared to people living in urban areas (Kaiser Family Foundation, 2003). A geographic disparity is shown in the uneven allocation of healthcare resources. Fewer than 10% of the US’s healthcare facilities and providers are located in rural areas despite rural America comprising approximately 20% of the nation’s population (Kaiser Family Foundation, 2020; Government Accounting Office, 2017). Another population of note is persons who experience mental health challenges as they are faced with 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 (Anderson, Jane-Llopis & Hosman, 2011; Chapman, Perry & Strine, 2005; Dew, 1998; Nemeroff, Musselman & Evans, 1998; McWilliams, Cox & Enns, 2003; Ortega et al., 2018). Forgoing medical care due to cost is more prevalent among those with mental health challenges (Dedania & Gonzalez, 2019; Fry & Sommers, 2018). Persons with mental health challenges also contend with perceptions of stigma amongst healthcare professionals, making it difficult to maneuver healthcare systems (Knaak et al., 2017; Thornicroft et al., 2007; Vistorte et al., 2018).

Access to healthcare encompasses a multi-dimensional definition as the opportunity to identify healthcare needs, to seek healthcare services, to reach, to obtain or use healthcare services and to actually have the need for services fulfilled. These culminate into five dimensions of access: approachability, acceptability, availability, affordability and appropriateness, which refer to the ability to perceive, to seek, to reach, to pay for, and to engage in services, respectively (Levesque et al., 2013). Approachability relates to the idea that people facing health needs can identify that some form of services exist and have an impact on their health. Acceptability denotes the social and cultural factors that determine a patient’s likelihood of accepting aspects of the services they are to receive. Availability represents the idea that healthcare services may be reached both physically and in a timely manner. Affordability refers to one’s economic capacity to pay for healthcare services without compromising basic necessities. Appropriateness marks the fit between healthcare services and a patient’s specific healthcare needs. This definition characterizes five dimensions of access to healthcare and was used as the guiding framework for this dissertation (Levesque et al., 2013).

This dissertation investigated each dimension of access to healthcare and its impact on persons who reside in rural areas and on those who experience mental health challenges. Three original research studies were conducted. The first study quantified barriers to
healthcare access among US adults with and without mental health challenges and examined the relationship between mental health challenges and not having a usual source of care. A cross-sectional study was conducted with data from the 2017–2018 National Health Interview Survey (NHIS). The variable mental health challenges was measured with the Kessler (K6) psychological distress scale and categorized into three levels: no, moderate and severe psychological distress. Eight barriers to healthcare access were collected from access to healthcare-based questions from the NHIS and paired to three of the five dimensions of access: approachability, availability and affordability. Not having a usual source of care, one of the barriers, was designated as the primary outcome. The sample included 50,103 adults. Most reported at least one barrier to healthcare access (95.6%) while 13.3% reported not having a usual source of care. Across each barrier, the prevalence was highest among those with severe psychological distress and lowest for those with no psychological distress. However, in multivariable models, severe and moderate psychological distress were not associated with not having a usual source of care (adjusted odds ratio [aOR], 0.92; 95% confidence interval [CI], 0.83–1.01; aOR: 0.88; 95% CI: 0.73–1.07). Male sex (aOR: 1.92; 95% CI: 1.78–2.06), Hispanic race/ethnicity (aOR: 1.59; 95% CI: 1.42–1.77), and worry to afford emergent (aOR: 1.38; 95% CI: 1.26–1.50) or normal (aOR: 1.60; 95% CI: 1.46–1.76) healthcare were associated with not having a usual source of care. Having a current partner (aOR: 0.88; 95% CI: 0.80–0.96), dependent(s) (aOR: 0.77; 95% CI: 0.70–0.85) and paid sick leave (aOR: 0.60; 95% CI: 0.56–0.65) were all protective.

The second study identified social, cultural and programmatic barriers to healthcare access. A qualitative study design was employed using a convenience sample of healthcare providers who currently practice in the state of Montana. Semi-structured interviews were used to identify barriers to healthcare access specifically relating to acceptability and appropriateness. These dimensions were the focus of this qualitative study because they are more difficult to quantify than the other three dimensions of healthcare access and are well-suited to be explored through qualitative methods. Analysis was both deductive and inductive and focused on three analytic domains: cultural considerations, patient-provider communication, and provider-provider communication. Twelve healthcare providers were interviewed; they represented diverse provider types and specialties of practice across five counties in Montana. Five key themes emerged from analysis: 1) a friction exists between aspects of patients’ rural identities and healthcare systems; 2) facilitating access to healthcare requires application of and respect for cultural differences; 3) communication between healthcare providers is systematically fragmented; 4) time and resource constraints disproportionately harm rural health systems; and 5) profits are prioritized over addressing barriers to healthcare access in the US.

The third study evaluated population-level disparities across Montana counties. The primary research aim examined the relationship between the density of healthcare providers per capita and suicide rates across Montana counties. This study employed an ecological study design and combined multiple secondary data sources: WIM Tracking, a health workforce information services company that provided up-to-date healthcare provider data; the Montana Department of Health and Human Services that provided
suicide data; and the American Community Survey that provided demographic and sociographic data for Montana counties. Since the experimental unit of an ecological study is population-based, access to healthcare was explored more broadly in this study compared to the first and second. The primary independent variable, the density of healthcare providers, served a proxy indicator of the dimension of approachability. Approachability includes elements of transparency and information regarding available treatment and services (Levesque et al., 2013). It marks an ability to perceive that is frequently evaluated in health systems research by determining whether one has a usual source of care when sick or in need of health advice, which a higher concentration of healthcare providers may facilitate (Brown et al., 2010; Choi, 2011; Gonzalez et al., 2019; Farietta, Lu & Tumin, 2018; Jones et al., 2014; Pullen et al., 2014; Sherrill & Gonzalez, 2017). Patient-to-provider ratios across Montana counties ranged from 0 to 3.2 per 1,000 persons. Between 2003 and 2019, a total of 3,830 suicide cases were identified in Montana. Age-adjusted suicide rates for each Montana county ranged from 0 to 39.8 per 100,000 persons, and 51 of the 56 counties exceeded the current national average. In adjusted analyses, no significant associations were found between the density of healthcare providers and suicide. Additionally, Montana counties with higher rates of people with at least a high school diploma, those born outside the US, and those with sufficient internet access associate with lower levels of suicide rates.

Several findings were identified from these studies. Across the US, the most prevalent barriers to healthcare access link to issues with affordability and barriers to healthcare access are higher among persons with mental health challenges. Inside rural health systems in Montana, healthcare consumers compose a hard-to-reach patient population, too few providers exist to meet population health needs, and fragmented communication impairs Montana’s health systems. These issues exacerbate the difficulty of ensuring acceptable and appropriate delivery of healthcare services in Montana and are compounded by other barriers to healthcare access rural residents experience. The findings from this dissertation suggest one overarching implication: individually experienced disparities in access to healthcare compound disparities in access at the system-level, just as they do within the context of rural health and mental health. To effectively address disparities in access to healthcare in the US, the individual and the system must both be carefully considered.
Chapter 2: Background

2.1 Overview of the United States Healthcare System

Unlike other countries, the US has no single nationwide system of health insurance. The US healthcare system is instead a mix of public and private, for-profit and nonprofit insurers and healthcare providers (Tikkanen et al., 2020). As a result, Americans access healthcare through a variety of avenues. Approximately 20% of Americans are covered through public health insurance programs funded by the federal government, which includes the Medicare program for adults age 65 and older and some persons with disabilities and the Medicaid program for veterans and persons with low-income (Kaiser Family Foundation, 2019). However, the dominant form of health insurance coverage is through private employer-sponsored insurance programs (Ridic et al., 2012). In 2020, approximately two-thirds of the American population was insured through their employer, largely due to the cost savings associated with group plans that can be purchased through an employer (Keisler-Starkey & Bunch, 2021; Santerre & Neun, 2013). The quality and level of health insurance coverage between and within public and private insurance spaces is variable, especially for those insured through their employer where certain healthcare needs may not be sufficiently covered (Capatina, 2020). Additionally, 8.6% of the American population has no health insurance coverage (Berchick et al., 2019). This rate was close to 20% in 2010, but the enactment of the Patient Protection and Affordable Care Act (ACA) represented the largest expansion to date of the government’s role in financing and regulating healthcare. It was largely responsible for un-insurance rates having declined over the last decade (Collins et al., 2019).

Some criteria used to evaluate healthcare systems around the world include how much countries spend on their healthcare, the quality and availability of that healthcare, how effective the healthcare system is at keeping the country’s population healthy, and how much upfront cost is incurred by its citizens (Murray & Frenk, 1999). Annually, the US spends approximately $10,586 per person on healthcare, which exceeds the next highest country by over $3,000 (Organization for Economic Co-operation and Development, 2022). However increased healthcare spending in the US does not associate with high health system performance or better health outcomes (Schneider et al., 2021). Compared to all other industrialized countries in the world, the US healthcare system is considered the most expensive and the least effective (Branning & Vater, 2016; Kumar et al., 2011). For Americans, upfront costs for healthcare are particularly burdensome. Regardless of what health insurance one has, Americans must account for embedded costs as part of their insurance package. This includes premiums (what one pays even if they do not make a claim), co-insurance (the percentage of healthcare costs one pays), deductives (what one pays before health insurance covers anything), and co-payments (what one must pay for any visit to a hospital or clinic). Today, less than 40% of Americans report they can comfortably cover an unexpected medical expense of $1,000, which is a
conservative estimate for the upfront costs of a single hospital visit (Berchick et al., 2019).

2.2 Access to Healthcare in the United States

Access to healthcare is a key determinant for overall health and makes a considerable impact throughout a person’s life. Lacking sufficient access increases lifetime risk of chronic illness, mortality and suicide (Gu et al., 2009; Jerant et al., 2012). One frequently used indicator of access to healthcare is whether one has a usual source of care when sick or in need of health advice. An estimated 17% of US adults report not having a usual source of care (National Center for Health Statistics, 2018). Despite continual efforts made to improve access to care for all Americans, this rate has stagnated over the last decade (Sommers et al., 2016; Fry & Sommers, 2018; Winkelman et al., 2016; McMorrow et al., 2017; Farietta, Lu & Tumin, 2018). Moreover, lack of access to healthcare is suspected to have substantially increased due to the novel coronavirus (SARS-CoV-2) pandemic (Kahraman, Orobello & Cirella, 2022). Americans also face multiple other barriers in accessing healthcare other than not having a usual source of care. Some of these barriers link to concerns about affordability, which lead to accruing debt or delaying or forgoing medical care altogether (Kalousova & Burgard, 2013). Other barriers pertain to availability, which can include long travel distances to reach healthcare services, lack of transportation, long times waiting in a clinic or hospital for an appointment, scheduling conflicts or the inability to take off work (Alcala et al., 2018; Miller & Wherry, 2017).

More abstract barriers to healthcare access tie to social and cultural factors that influence the acceptability and appropriateness of care. One example is a woman not willing to discuss reproductive health issues with a male, but the only physician nearby is male. Another example is coercing ethnic minority populations to engage in pharmacological means of treatment that may contradict their beliefs (Washington et al., 2011). Often, these social and cultural barriers may be experienced in combination with other barriers, making it difficult to pinpoint any one barrier as the sole reason for a person’s lack of access to healthcare. One well documented finding, however, shows that having a usual source of care is the most protective factor to ensure persons can receive care for any standard or emergent medical need (Blewett et al., 2008; Jerant et al., 2012; Manuel, 2018). Nonetheless, all barriers to healthcare access require careful consideration in order to sufficiently address this growing public health concern (Levesque et al., 2013).

2.3 Rural Health Disparities

Health disparities are differences in health status for certain sub-groups of a population, often characterized by higher incidence of disease or disability, health-risk behaviors, mortality, and lower life expectancy. Rural Americans comprise a population that is subject to many health disparities. A report issued by the US Department of Health and Human Services found the prevalence of several positive health behaviors to be lower among persons in rural, non-core communities compared to persons in large, medium and
small metropolitan areas (Matthews et al., 2017). The report also found a stark difference in some health risk behaviors, most notably adolescent smoking is twice as prevalent among rural youth as compared to urban youth. For generations, life expectancy is lower in rural counties than urban counties in the US (Singh et al., 2017). Since 2000, all-cause mortality rates have decreased across the US, but the decreases were greater in urban areas (Singh & Siahpush, 2014). The percent of excess, or potentially preventable deaths, for the five leading causes of death in the US are each 15-30% more prevalent in rural communities compared to urban communities (Moy et al., 2017).

Other disparities between rural and urban persons impact the aforementioned differences in health outcomes. Rural residents, for instance, tend to have lower household income and higher rates of un- and under-insurance (Lorenzoni et al., 2019; Winkelman et al., 2016). There is also the growing challenge of national healthcare provider shortages, which disproportionately affect rural communities (Kaiser Family Foundation, 2020; Government Accounting Office, 2017; Zhang et al., 2020). These socio- and provider-based disparities influence rural residents’ access to healthcare through affordability- and availability-related barriers. As a result, healthcare services are utilized less often in rural areas (MacKinney et al., 2014). Overall, higher mortality in rural areas is largely explained by socioeconomic deprivation, physician shortages, and lack of health insurance (Gong et al., 2019). The divide between rural and urban health has been studied for decades, which warranted the creation of a federal initiative called Rural Healthy People 2020 to serve as counterpart to Healthy People 2020. The specific aim of Rural Healthy People 2020 was to identify rural health priorities from among those recognized at the national-level (Bolin et al., 2015).

2.4 Mental Health Disparities

Overall, mental health challenges account for one-third of the world’s disability caused by adult health problems and are widely acknowledged as a major pandemic of the 21st century (Lake & Turner, 2017; Anderson, Jane-Llopis & Hosman, 2011). According to the World Health Organization, the lifetime prevalence of any mental illness for individuals is about 50%, ranking above all other conditions when estimating disease burden (Alonso et al., 2011). In 2018, nearly one in five US adults was diagnosed with a mental health disorder (Bailey et al., 2011). In the last 20 years, suicide, often used to measure mental health outcomes, has shown a 33% age-adjusted increase (National Alliance on Mental Illness, 2017).

Persons with mental health challenges have higher risk of onset, persistence and severity of a wide range of physical disorders (Anderson, Jane-Llopis & Hosman, 2011; Chapman, Perry & Strine, 2005; Dew, 1998; Nemeroff, Musselman & Evans, 1998; McWilliams, Cox & Enns, 2003; Ortega et al., 2018). This elevated risk of co-occurring physical health issues results in lower overall use of healthcare services and lower life expectancy among persons with mental health challenges (Corscadden, Callander & Topp, 2018). There are cultural factors that are suspected to impact health disparities for persons with mental health challenges. Particularly in Western cultures, persons with
mental health challenges are marginalized, which is largely attributed to cultural factors among many demographic populations that perpetuate stigma of mental illness (Ran et al., 2021). Numerous studies in industrialized countries have demonstrated that people with mental health challenges have more obstacles in accessing healthcare compared to those without. Perceived barriers, for instance, are two to three times higher among those experiencing depression (Abar et al., 2018). Not having a usual source of care when sick or in need of health advice has a positive linear association with one’s level of psychological distress (Sherrill & Gonzales, 2017). Other affordability- and availability-related barriers have shown comparable effects, which lead to higher rates of unmet healthcare needs and delaying care among those with mental health challenges (Corscadden, Callander & Topp, 2019; Jones et al., 2014; Du & Xu, 2016; Owen, Heller & Bowers, 2016; Rowan, McAlpine & Blewett, 2013).

There are varying definitions for mental health disparities. Mental Health Science Group representatives from the National Institute of Mental Health defined a mental health disparity as a significant disparity in the overall rate of mental illness incidence or prevalence, morbidity, mortality or survival rates in a health disparity sub-population. SAMHSA (Substance Abuse and Mental Health Services Administration), the nation’s lead mental health service agency, expands the definition of mental health disparity as the power imbalances that impact practices influencing access, quality, and outcomes of behavioral health care (Safran et al., 2009). This dissertation focuses on the former definition. Moreover, the population of persons with mental health challenges is heterogeneous as there are a variety of diverse diagnosable mental illnesses as reported in the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013). As a result, this dissertation focuses on the population of “persons with mental health challenges” to maintain a conservative level of sensitivity for inclusion of persons with any mental health disorder, whether or not they have received a formal diagnosis.
Chapter 3: Barriers to healthcare access among U.S. adults with mental health challenges: A population-based study

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.

Keywords: Mental Health, Healthcare Access, Barriers

1 MHC = Mental health challenges; NUSC = No usual source of care
3.1 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 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 remain 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 (Corscadden 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.

3.2. Material and methods

3.2.1 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 ember. 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.

3.2.2 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).
3.2.3 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.

3.2.4 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, Lu & Tumin, 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).

3.2.5 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 research.

<table>
<thead>
<tr>
<th>Table 1. NHIS question items used to measure healthcare access</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHIS question</td>
</tr>
</tbody>
</table>

15
1. Is there a place that you USUALLY go to when you are sick or need advice about your health?  

| Have you delayed getting care for any of the following reasons in the past 12 months? |
| 1. You couldn’t get through on the telephone. |
| 2. You couldn’t get an appointment soon enough. |
| 3. Once you get there, you have to wait too long to see the doctor. |
| 4. The clinic/doctor’s office wasn’t open when you could get there. |
| 5. You didn’t have transportation. |

2. If you get sick or have an accident, how worried are you that you will be able to pay your medical bills?  

3. How worried are you right now about not being able to pay medical costs for normal healthcare?

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).

3.2.6 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.
3.3 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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>All (n=50,103)</th>
<th>Have a usual source of care (n=44,043)</th>
<th>Do not have a usual source of care (n=6,060)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± S.E. age, year</td>
<td>47.4 ± 0.10</td>
<td>49.0 ± 0.11</td>
<td>37.3 ± 0.22</td>
</tr>
<tr>
<td>Female, no. (%)</td>
<td>27,350 (51.6)</td>
<td>24,932 (53.8)</td>
<td>2,418 (37.6)</td>
</tr>
<tr>
<td>Race, no. (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>40,124 (78.2)</td>
<td>35,384 (78.4)</td>
<td>4,740 (76.5)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>5,651 (12.2)</td>
<td>4,973 (12.2)</td>
<td>678 (12.4)</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>573 (1.2)</td>
<td>513 (1.2)</td>
<td>60 (1.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>2,599 (6.3)</td>
<td>2,216 (6.2)</td>
<td>383 (6.5)</td>
</tr>
<tr>
<td>Multiple races</td>
<td>1,045 (2.1)</td>
<td>865 (1.9)</td>
<td>180 (3.5)</td>
</tr>
<tr>
<td>Ethnicity, no. (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>6,191 (16.2)</td>
<td>4,915 (14.6)</td>
<td>1,276 (26.7)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>43,912 (83.8)</td>
<td>39,128 (85.4)</td>
<td>4,784 (73.3)</td>
</tr>
<tr>
<td>Marital Status: Partner, no. (%)</td>
<td>25,434 (60.3)</td>
<td>22,802 (61.6)</td>
<td>2,632 (52.2)</td>
</tr>
<tr>
<td>Dependent(s) in home, no. (%)</td>
<td>11,500 (27.2)</td>
<td>9,969 (26.9)</td>
<td>1,531 (28.9)</td>
</tr>
<tr>
<td>Employment status in the last week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working for pay at a job or business</td>
<td>27,784 (60.2)</td>
<td>23,552 (58.4)</td>
<td>4,232 (71.3)</td>
</tr>
</tbody>
</table>
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.

Table 3. Barriers to healthcare access across all levels of psychological distress

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
<th>All (n=50,103)</th>
<th>SPD (n=1,884)</th>
<th>MPD (n=10,324)</th>
<th>NPD (n=37,895)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approachability</td>
<td>Not having a place that you usually go to when you are sick or need advice about your health, no. (%)</td>
<td>6,060 (13.3)</td>
<td>252 (14.4)</td>
<td>1336 (14.1)</td>
<td>4,472 (13.0)</td>
</tr>
<tr>
<td></td>
<td>Delayed getting medical care in past 12 months because...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>You couldn’t get through on the telephone, no. (%)</td>
<td>1,529 (3.0)</td>
<td>197 (10.6)</td>
<td>582 (5.6)</td>
<td>750 (1.9)</td>
</tr>
<tr>
<td></td>
<td>You couldn’t get an appointment soon enough, no. (%)</td>
<td>3,798 (7.5)</td>
<td>390 (19.9)</td>
<td>1,340 (13.0)</td>
<td>2,068 (5.4)</td>
</tr>
<tr>
<td></td>
<td>Once you get there, you have to wait too long to see the doctor, no. (%)</td>
<td>2,287 (4.6)</td>
<td>257 (13.8)</td>
<td>752 (7.3)</td>
<td>1,278 (3.5)</td>
</tr>
<tr>
<td></td>
<td>The clinic/doctor’s office wasn’t open when you could get there, no. (%)</td>
<td>1,776 (3.5)</td>
<td>215 (10.9)</td>
<td>671 (6.4)</td>
<td>890 (2.4)</td>
</tr>
<tr>
<td></td>
<td>You didn’t have transportation, no. (%)</td>
<td>1,231 (2.1)</td>
<td>265 (12.0)</td>
<td>515 (4.0)</td>
<td>451 (1.1)</td>
</tr>
<tr>
<td></td>
<td>Very worried or somewhat worried of being...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>Able to pay medical bills if you get sick or have an accident, no. (%)</td>
<td>21,268 (44.1)</td>
<td>1,275 (68.3)</td>
<td>5,922 (59.3)</td>
<td>14,071 (38.9)</td>
</tr>
<tr>
<td></td>
<td>Able to pay medical costs for normal healthcare, no. (%)</td>
<td>12,784 (27.0)</td>
<td>1,137 (61.3)</td>
<td>4,053 (40.6)</td>
<td>7,594 (21.7)</td>
</tr>
</tbody>
</table>

Total Number of Self-Reported Barriers to Healthcare Access, mean

<table>
<thead>
<tr>
<th>Dimension</th>
<th>All (n=50,103)</th>
<th>SPD (n=1,884)</th>
<th>MPD (n=10,324)</th>
<th>NPD (n=37,895)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1.8</td>
<td>2.8</td>
<td>2.2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

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.

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 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.

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model #1</th>
<th>Model #2</th>
<th>Model #3</th>
<th>Model #4</th>
<th>Model #5</th>
<th>Model #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Distress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
</tr>
<tr>
<td>Moderate</td>
<td>1.10 (1.00, 1.19)</td>
<td>1.07 (0.98, 1.17)</td>
<td>1.05 (0.96, 1.15)</td>
<td>1.03 (0.94, 1.13)</td>
<td>1.05 (0.96, 1.15)</td>
<td>0.92 (0.83, 1.01)</td>
</tr>
<tr>
<td>Severe</td>
<td>1.13 (0.94, 1.35)</td>
<td>1.19 (0.99, 1.43)</td>
<td>1.11 (0.92, 1.34)</td>
<td>1.07 (0.88, 1.30)</td>
<td>1.12 (0.93, 1.37)</td>
<td>0.88 (0.73, 1.07)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
</tr>
<tr>
<td>Male</td>
<td>1.93 (1.79, 2.07)</td>
<td>1.89 (1.75, 2.03)</td>
<td>1.87 (1.74, 2.01)</td>
<td>1.86 (1.73, 2.00)</td>
<td>1.92 (1.78, 2.06)</td>
<td></td>
</tr>
<tr>
<td>Age 18-25</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
</tr>
<tr>
<td>Age 26-34</td>
<td>1.05 (0.95, 1.16)</td>
<td>1.20 (1.07, 1.34)</td>
<td>1.34 (1.20, 1.51)</td>
<td>1.35 (1.21, 1.52)</td>
<td>1.26 (1.12, 1.41)</td>
<td></td>
</tr>
<tr>
<td>Age 35-49</td>
<td>0.53 (0.47, 0.60)</td>
<td>0.64 (0.57, 0.73)</td>
<td>0.72 (0.63, 0.82)</td>
<td>0.72 (0.63, 0.82)</td>
<td>0.63 (0.56, 0.73)</td>
<td></td>
</tr>
<tr>
<td>Age 50-64</td>
<td>0.33 (0.29, 0.37)</td>
<td>0.36 (0.31, 0.40)</td>
<td>0.40 (0.35, 0.46)</td>
<td>0.41 (0.36, 0.46)</td>
<td>0.35 (0.31, 0.40)</td>
<td></td>
</tr>
<tr>
<td>Age 65-84</td>
<td>0.14 (0.12, 0.16)</td>
<td>0.14 (0.12, 0.17)</td>
<td>0.18 (0.15, 0.21)</td>
<td>0.18 (0.15, 0.21)</td>
<td>0.18 (0.15, 0.20)</td>
<td></td>
</tr>
<tr>
<td>Age 85+</td>
<td>0.07 (0.05, 0.11)</td>
<td>0.07 (0.05, 0.11)</td>
<td>0.09 (0.07, 0.14)</td>
<td>0.09 (0.07, 0.14)</td>
<td>0.10 (0.07, 0.14)</td>
<td></td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
<td>1.00 (reference)</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>1.08 (0.95, 1.24)</td>
<td>1.04 (0.91, 1.20)</td>
<td>1.06 (0.92,1.21)</td>
<td>1.06 (0.92, 1.21)</td>
<td>0.99 (0.86, 1.13)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Other</td>
<td>1.17 (1.02, 1.35)</td>
<td>1.16 (1.01, 1.34)</td>
<td>1.16 (1.01, 1.34)</td>
<td>1.17 (1.02, 1.35)</td>
<td>1.15 (1.00, 1.32)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.82 (1.63, 2.03)</td>
<td>1.84 (1.65, 2.06)</td>
<td>1.81 (1.62, 2.02)</td>
<td>1.82 (1.62, 2.03)</td>
<td>1.59 (1.42, 1.77)</td>
<td></td>
</tr>
<tr>
<td>Lifestyle Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Partner</td>
<td>0.86 (0.79, 0.94)</td>
<td>0.88 (0.81, 0.97)</td>
<td>0.88 (0.81, 0.97)</td>
<td>0.88 (0.80, 0.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent(s)</td>
<td>0.80 (0.73, 0.88)</td>
<td>0.79 (0.71, 0.87)</td>
<td>0.78 (0.71, 0.86)</td>
<td>0.77 (0.70, 0.85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current source of income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple jobs</td>
<td>1.04 (0.91, 1.20)</td>
<td>1.05 (0.91, 1.20)</td>
<td>1.04 (0.91, 1.20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid sick leave</td>
<td>0.56 (0.51, 0.60)</td>
<td>0.56 (0.51, 0.60)</td>
<td>0.60 (0.56, 0.65)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability-related barriers,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>delayed care because...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You couldn’t get through the</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>telephone.</td>
<td>1.01 (0.79, 1.29)</td>
<td>0.96 (0.75, 1.23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You couldn’t get an appointment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>soon enough.</td>
<td>0.70 (0.59, 0.83)</td>
<td>0.67 (0.56, 0.80)</td>
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<td>Once you get there, you</td>
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<td>have to wait too long to see</td>
<td>0.99 (0.82, 1.18)</td>
<td>0.92 (0.76, 1.10)</td>
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<td>the doctor.</td>
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<td>wasn’t open when you could get</td>
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<td>there.</td>
<td>1.10 (0.90, 1.35)</td>
<td>1.05 (0.85, 1.29)</td>
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<td>You didn’t have transportation.</td>
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<td>0.90 (0.70, 1.15)</td>
<td>0.86 (0.67, 1.11)</td>
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<td>Affordability-related barriers,</td>
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<td>You are able to pay your</td>
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<td>medical bills if you get sick</td>
<td>1.38 (1.26, 1.50)</td>
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<td>or have an accident</td>
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<td>You are able to pay medical</td>
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<td>1.60 (1.46, 1.76)</td>
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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% 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.

3.4 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, 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, 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, one may likely be concerned about cost should one get sick or have an accident, and general concerns related to cost may also interfere with one’s 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 rural 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 perceived stigma toward 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, and 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 investigating 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 in self-reported data, which 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 reduce 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.

3.5 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 in 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.
Chapter 4: A qualitative study of rural healthcare providers’ views of social, cultural, and programmatic barriers to healthcare access

Abstract

**Background.** Ensuring access to healthcare is a complex, multi-dimensional health challenge. Since the inception of the coronavirus pandemic, this challenge is more pressing. Some dimensions of access are difficult to quantify, namely characteristics that influence healthcare services to be both acceptable and appropriate. These link to a patient’s acceptance of services that they are to receive and ensuring appropriate fit between services and a patient’s specific healthcare needs. These dimensions of access are particularly evident in rural health systems where additional structural barriers make accessing healthcare more difficult. Thus, it is important to examine healthcare access barriers in rural-specific areas to understand their origin and implications for resolution.

**Methods.** We used qualitative methods and a convenience sample of healthcare providers who currently practice in the rural US state of Montana. Our sample included 12 healthcare providers from diverse training backgrounds and specialties. All were decision-makers in the development or revision of patients’ treatment plans. Semi-structured interviews and content analysis were used to explore barriers—acceptability and appropriateness—to healthcare access in their patient populations. Our analysis was both deductive and inductive and focused on three analytic domains: cultural considerations, patient-provider communication, and provider-provider communication. Member checks ensured credibility and trustworthiness of our findings.

**Results.** Five key themes emerged from analysis: 1) a friction exists between aspects of patients’ rural identities and healthcare systems; 2) facilitating access to healthcare requires application of and respect for cultural differences; 3) communication between healthcare providers is systematically fragmented; 4) time and resource constraints disproportionately harm rural health systems; and 5) profits are prioritized over addressing barriers to healthcare access in the US.

**Conclusions.** Inadequate access to healthcare is an issue in the US, particularly in rural areas. Rural healthcare consumers compose a hard-to-reach patient population. Too few providers exist to meet population health needs, and fragmented communication impairs rural health systems’ ability to function. These issues exacerbate the difficulty of ensuring acceptable and appropriate delivery of healthcare services, which compound all other barriers to healthcare access for rural residents. Each dimension of access must be monitored to improve patient experiences and outcomes for rural Americans.
Keywords
Access to Healthcare, Rural Health, Qualitative Methods
4.1 Background

Unequal access to healthcare services is an important element of health disparities in the United States (Riley, 2012), and there remains much about access that is not fully understood. The lack of understanding is attributable, in part, to the lack of uniformity in how access is defined and evaluated, and the extent to which access is often oversimplified in research (Levesque et al., 2013). Subsequently, attempts to address population-level barriers to healthcare access are insufficient, and access remains an unresolved, complex health challenge (Serban, 2019; Roncarolo et al., 2017; Cabrera-Barona, Blaschke & Kienberger, 2017). This paper presents a study that aims to explore some of the less well studied barriers to healthcare access, particularly those that influence healthcare acceptability and appropriateness.

In truth, healthcare access entails a complicated calculus that combines characteristics of individuals, their households, and their social and physical environments with characteristics of healthcare delivery systems, organizations, and healthcare providers. For one to fully ‘access’ healthcare, they must have the means to identify their healthcare needs and have available to them care providers and the facilities where they work. Further, patients must then reach, obtain, and use the healthcare services in order to have their healthcare needs fulfilled. Levesque and colleagues critically examined access conceptualizations in 2013 and synthesized all ways in which access to healthcare was previously characterized; Levesque et al. proposed five dimensions of access: approachability, acceptability, availability, affordability and appropriateness (Levesque et
al., 2013). These refer to the ability to perceive, seek, reach, pay for, and engage in services, respectively.

According to Levesque et al.’s framework, the five dimensions combine to facilitate access to care or serve as barriers. Approachability indicates that people facing health needs understand that healthcare services exist and might be helpful. Acceptability represents whether patients see healthcare services as consistent or inconsistent with their own social and cultural values and worldviews. Availability indicates that healthcare services are reached both physically and in a timely manner. Affordability simplifies one’s capacity to pay for healthcare services without compromising basic necessities, and finally, appropriateness represents the fit between healthcare services and a patient’s specific healthcare needs (Levesque et al., 2013). This study focused on the acceptability and appropriateness dimensions of access.

Before the novel coronavirus (SARS-CoV-2; COVID-19) pandemic, approximately 13.3% of adult in the US did not have a usual source of healthcare (Coombs et al., 2021). Millions more did not utilize services regularly, and close to two-thirds reported that they would be debilitated by an unexpected medical bill (Farietta, Lu & Tumin, 2018; Sommers et al., 2016; National Alliance on Mental Illness, 2017). Findings like these emphasized a fragility in the financial security of the American population (Pollitz et al., 2020). These concerns were exacerbated by the pandemic when a sudden surge in unemployment increased un- and under-insurance rates (Kahraman, Orobello & Cirella, 2022). Indeed, employer-sponsored insurance covers close to half of Americans’ total cost of illness (Blumenthal et al., 2020). Unemployment linked to COVID-19 cut off the lone outlet to healthcare access for many. Health-related financial concerns expanded
beyond individuals, as healthcare organizations were unequipped to manage a simultaneous increase in demand for specialized healthcare services and a steep drop off for routine revenue-generating healthcare services (Defêche et al, 2021). These consequences of the COVID-19 pandemic all put additional, unexpected pressure on an already fragmented US healthcare system.

Other structural barriers to healthcare access exist in relation to the rural-urban divide. Less than 10% of US healthcare resources are located in rural areas where approximately 20% of the American population resides (Rosenblatt & Hart, 2000). In a country with substantially fewer providers per capita compared to many other developed countries, persons in rural areas experience uniquely pressing healthcare provider shortages (Kaiser Family Foundation, 2020; Government Accounting Office, 2017). Rural inhabitants also tend to have lower household incomes, higher rates of un- or under-insurance, and more difficulty with travel to healthcare clinics than urban dwellers (Kaiser Family Foundation, 2003). Subsequently, persons in rural communities use healthcare services at lower rates, and potentially preventable hospitalizations are more prevalent (Wright et al., 2018). This disparity often leads rural residents to use services primarily for more urgent needs and less so for routine care (Weichelt, Bendixsen & Patrick, 2019; Mangundu et al., 2020; Rahayu, Araki & Rosleine, 2020).

The differences in how rural and urban healthcare systems function warranted a federal initiative to focus exclusively on rural health priorities and serve as counterpart to Healthy People objectives (Bolin et al., 2015). The rural determinants of health, a more specific expression of general social determinants, add issues of geography and topography to the well-documented social, economic and political factors that influence
all Americans’ access to healthcare (Reid, 2019). As a result, access is consistently regarded as a top priority in rural areas, and many research efforts have explored the intersection between access and rurality, namely within its less understood dimensions (acceptability and appropriateness).

4.1.1 Acceptability-related barriers to care

Acceptability represents the dimension of healthcare access that affects a patient’s ability to seek healthcare, particularly linked to one’s professional values, norms and culture (Levesque et al., 2013). Access to health information is an influential factor for acceptable healthcare and is essential to promote and maintain a healthy population (Wynia & Osborn, 2010). According to the Centers for Disease Control and Prevention, health literacy or a high ‘health IQ’ is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others, which impacts healthcare use and system navigation (Centers for Disease Control and Prevention, 2022). The literature indicates that lower levels of health literacy contribute to health disparities among rural populations (Davis et al., 2012; Halverson et al., 2013; Zahnd et al., 2009). Evidence points to a need for effective health communication between healthcare organizations and patients to improve health literacy (Wynia & Osborn, 2010). However, little research has been done in this area, particularly as it relates to technologically-based interventions to disseminate health information (Dogba et al., 2019).

Stigma, an undesirable position of perceived diminished status in an individual’s social position, is another challenge that influences healthcare acceptability (National Academics Press (US), 2016). Those who may experience stigma fear negative social
consequences in relation to care seeking. They are more likely to delay seeking care, especially among ethnic minority populations (Wu et al., 2019; Meyer et al., 2016). Social media presents opportunities for the dissemination of misleading medical information; this runs further risk for stigma (Heinrich, 2020). Stigma is difficult to undo, but research has shown that developing a positive relationship with a healthcare provider or organization can work to reduce stigma among patients, thus promoting healthcare acceptability (Esquivel et al., 2017).

A provider’s attempts to engage patients and empower them to be active decision-makers regarding their treatment has also been shown to improve healthcare acceptability. One study found that patients with heart disease who completed a daily diary of weight and self-assessment of symptoms, per correspondence with their provider, had better care outcomes than those who did not (Park et al., 2017). Engaging with household family members and involved community healers also mitigates barriers to care, emphasizing the importance of a team-based approach that extends beyond those who typically provide healthcare services (Taleb et al., 2015; Billah et al., 2018). One study, for instance, explored how individuals closest to a pregnant woman affect the woman’s decision to seek maternity care; partners, female relatives, and community health-workers were among the most influential in promoting negative views, all of which reduced a woman’s likelihood to access care (Kaiser et al., 2019).

4.1.2 Appropriateness-related barriers to care

 Appropriateness marks the dimension of healthcare access that affects a patient’s ability to engage, and according to Levesque et al., is of relevance once all other dimensions (the ability to perceive, seek, reach and pay for) are achieved (Levesque et al., 2013). The
ability to engage in healthcare is influenced by a patient’s level of empowerment, adherence to information, and support received by their healthcare provider. Thus, barriers to healthcare access that relate to appropriateness are often those that indicate a breakdown in communication between a patient with their healthcare provider. Such breakdown can involve a patient experiencing miscommunication, confrontation, and/or a discrepancy between their provider’s goals and their own goals for healthcare.

Appropriateness represents a dimension of healthcare access that is widely acknowledged as an area in need of improvement, which indicates a need to rethink how healthcare providers and organizations can adapt to serve the healthcare needs of their communities (Rao & Sheffel, 2018). This is especially true for rural, ethnic minority populations, which disproportionately experience an abundance of other barriers to healthcare access. Culturally appropriate care is especially important for members of minority populations (Lee et al., 2019; Lyford et al., 2018; Rohr et al., 2019). Ultimately, patients value a patient-provider relationship characterized by a welcoming, non-judgmental atmosphere (Johnston et al., 2015; Legido-Quigley et al., 2019). In rural settings especially, level of trust and familiarity are common factors that affect service utilization (Shaw et al., 2017). Evidence suggests that kind treatment by a healthcare provider who promotes patient-centered care can have a greater overall effect on a patient’s experience than a provider’s degree of medical knowledge or use of modern equipment (Larson et al., 2015). Of course, investing the time needed to nurture close and caring interpersonal connections is particularly difficult in under-resourced, time-pressured rural health systems (Spleen et al., 2014; Weisgrau, 1995).
4.1.3 Rationale

The most effective way to evaluate access to healthcare largely depends on which dimensions are explored. For instance, a population-based survey can be used to measure the barrier of healthcare affordability. Survey questions can inquire directly about health insurance coverage, care-related financial burden, concern about healthcare costs, and the feared financial impacts of illness and/or disability. Many national organizations have employed such surveys to measure affordability-related barriers to healthcare. For example, a question may ask explicitly about financial concerns: ‘If you get sick or have an accident, how worried are you that you will not be able to pay your medical bills?’ (National Center for Health Statistics, 2018). Approachability and availability dimensions of access are also studied using quantitative analysis of survey questions, such as ‘Is there a place that you usually go to when you are sick or need advice about your health?’ or ‘Have you ever delayed getting medical care because you couldn’t get through on the telephone?’ In contrast, the remaining two dimensions--acceptability and appropriateness--require a qualitative approach, as the social and cultural factors that determine a patient’s likelihood of accepting aspects of the services that are to be received (acceptability) and the fit between those services and the patient’s specific healthcare needs (appropriateness) can be more abstract (Sekhon et al., 2017; Dyer et al., 2016). In social science, qualitative methods are appropriate to generate knowledge of what social events mean to individuals and how those individuals interact within them; these methods allow for an exploration of depth rather than breadth (Padgett, 2012; Tolley et al., 2016). Qualitative methods, therefore, are appropriate tools for
understanding the depth of healthcare providers’ experiences in the inherently social context of seeking and engaging in healthcare.

In sum, acceptability- and appropriateness-related barriers to healthcare access are multi-layered, complex and abundant. Ensuring access becomes even more challenging if structural barriers to access are factored in. In this study, we aimed to explore barriers to healthcare access among persons in Montana, a historically underserved, under-resourced, rural region of the US. Montana is the fourth largest and third least densely populated state in the country; more than 80% of Montana counties are classified as non-core (the lowest level of urban/rural classification), and over 90% are designated as health professional shortage areas (Ingram & Franco, 2013; Health Resources & Services Administration, 2021). Qualitative methods supported our inquiry to explore barriers to healthcare access related to acceptability and appropriateness.

4.2 Methods

4.2.1 Participants

Qualitative methods were utilized for this interpretive, exploratory study because knowledge regarding barriers to healthcare access within Montana’s rural health systems is limited. We chose Montana healthcare providers, rather than patients, as the population of interest so we may explore barriers to healthcare access from the perspective of those who serve many persons in rural settings. Inclusion criteria required study participants to provide direct healthcare to patients at least one-half of their time. We defined ‘provider’ as a healthcare organization employee with clinical decision-making power and the qualifications to develop or revise patients’ treatment plans. In an attempt to capture a
group of providers with diverse experience, we included providers across several types and specialties. These specialties included advanced practice registered nurses (APRNs), physicians (MDs and DOs), and physician assistants (PAs) who worked in critical care medicine, emergency medicine, family medicine, hospital medicine, internal medicine, pain medicine, palliative medicine, pediatrics, psychiatry, and urgent care medicine. We also included licensed clinical social workers (LCSWs) and clinical psychologists who specialize in behavioral healthcare provision.

4.2.2 Recruitment and Data Collection

We recruited participants via email using a snowball sampling approach (Shaghaghi et al., 2011). We opted for this approach because of its effectiveness in time-pressured contexts, such as the COVID-19 pandemic, which has made healthcare provider populations hard to reach (Sadler et al., 2010). Considering additional constraints with the pandemic and the rural nature of Montana, interviews were administered virtually via Zoom video or telephone conferencing with Zoom’s audio recording function enabled. All interviews were conducted by the first author between January and September 2021. The average length of interviews was 50 minutes, ranging from 35 to 70 minutes. There were occasional challenges experienced during interviews (poor cell phone reception from participants, dropped calls), in which case the interviewer remained on the line until adequate communication was resumed. All interviews were included for analysis and transcribed verbatim into NVivo Version 12 software. All qualitative data were saved and stored on a password-protected University of Montana server. Hard-copy field notes were securely stored in a locked office on the university’s main campus.
4.2.3 Procedure

Data analysis included a deductive followed by an inductive approach. This dual analysis adheres to Levesque’s framework for qualitative methods, which is discussed in the Definition of Analytic Domains sub-section below. Original synthesis of the literature informed the development of our initial deductive codebook. The deductive approach was derived from a theory-driven hypothesis, which consisted of synthesizing previous research findings regarding acceptability- and appropriateness-related barriers to care. Although the locations, patient populations and specific type of healthcare services varied by study in the existing literature, several recurring barriers to healthcare access were identified. We then operationalized three analytic domains based on these findings: cultural considerations, patient-provider communication, and provider-provider communication. These domains were chosen for two reasons: 1) the terms ‘culture’ and ‘communication’ were the most frequently documented characteristics across the studies examined, and 2) they each align closely with the acceptability and appropriateness dimensions of access to healthcare, respectively. In addition, ‘culture’ is included in the definition of acceptability and ‘communication’ is a quintessential aspect of appropriateness. These domains guided the deductive portion of our analysis, which facilitated the development of an interview guide used for this study.

Interviews were semi-structured to allow broad interpretations from participants and expand the open-ended characterization of study findings. Data were analyzed through a flexible coding approach proposed by Deterding and Waters (Deterding & Waters, 2021). Qualitative content analysis was used, a method particularly beneficial for analyzing large amounts of qualitative data collected through interviews that offers possibility of
quantifying categories to identify emerging themes (Padgett, 2012; Schreier et al., 2019). After fifty percent of data were analyzed, we used an inductive approach as a formative check and repeated until data saturation, or the point at which no new information was gathered in interviews (Guest et al., 2020). At each point of inductive analysis, interview questions were added, removed, or revised in consideration of findings gathered (Mayring, 2000). The Standards for Reporting Qualitative Research (SRQR) was used for reporting all qualitative data for this study (O'Brien et al., 2014). The first and third authors served as primary and secondary analysts of the qualitative data and collaborated to triangulate these findings. An audit approach was employed, which consisted of coding completed by the first author and then reviewed by the third author. After analyses were complete, member checks ensured credibility and trustworthiness of findings (Carter et al., 2014). Member checks consisted of contacting each study participant to explain the study’s findings; one-third of participants responded and confirmed all findings. All study procedures were reviewed and approved by the Human Subjects Committee of the authors’ institution’s Institutional Review Board.

4.2.4 Definitions of Analytic Domains

4.2.4.1 Cultural Considerations

Human development is influenced in part by social-emotional experiences during childhood, adolescence, and early adulthood, particularly those that link to one’s cultural environment that shapes ideas and behaviors over time (Berkman et al., 2000; Marmot & Wilkinson, 2006). Sociocultural factors vary widely across populations and geographic regions. Whereas the concept of being an ‘American’ implies a notion of a homogenous people, myriad cultural characteristics compose American identities. Accordingly,
variability exists in the ways Americans engage in healthcare and healthful behavior (Constitution of the World Health Organization, 2005). Notwithstanding this variability, Western health systems often fail to consider aspects of patients’ cultural perspectives and histories. This can manifest in the form of a provider’s lack of cultural humility. Cultural humility is a process of preventing imposition of one’s worldview and cultural beliefs on others and recognizing that everyone’s conception of the world is valid. Humility cultivates sensitive approaches in treating patients (Miller, 2009). A lack of cultural humility impedes the delivery of acceptable and appropriate healthcare (Prasad et al., 2016), which can involve low empathy or respect for patients, or dismissal of culture and traditions as superstitions that interfere with standard treatments (George et al., 2020; Romanelli & Hudson, 2017). Ensuring cultural humility among all healthcare employees is a step toward optimal healthcare delivery. Cultural humility is often accomplished through training that can be tailored to particular cultural- or gender-specific populations (Bailie et al., 2015; Reeve et al., 2015). Since cultural identities and humility have been marked as factors that can heavily influence patients’ access to care, cultural considerations composed our first analytic domain. To assess this domain, we asked participants how they address the unique needs of their patients, how they react when they observe a cultural behavior or attitude from a patient that may not directly align with their treatment plan, and if they have received any multicultural training or training on cultural considerations in their current role.

4.2.4.2 Patient-Provider Communication

Other barriers to healthcare access can be linked to ineffective patient-provider communication. Patients who do not feel involved in healthcare decisions are less likely
to adhere to treatment recommendations (Swan et al., 2020). Patients who experience communication difficulties with providers may feel coerced, which generates disempowerment and leads patients to employ more covert ways of engagement (Kabia et al., 2019; Ho et al., 2017). Language barriers can further compromise communication and hinder outcomes or patient progress (Latif et al., 2020; Tschirhart et al., 2019). Any miscommunication between a patient and provider can affect one’s access to healthcare, namely affecting appropriateness-related barriers. For these reasons, patient-provider communication composed our second analytic domain. We asked participants to highlight the challenges they experience when communicating with their patients, how those complications are addressed, and how communication strategies inform confidentiality in their practice. Confidentiality is a core ethical principle in healthcare, especially in rural areas that have smaller, interconnected patient populations (Ireland et al., 2020).

### 4.2.4.3 Provider-Provider Communication

A patient’s journey through the healthcare system necessitates sufficient correspondence between patients, primary, and secondary providers after discharge and care encounters (Stokes et al., 2019). Inter-provider and patient-provider communication are areas of healthcare that are acknowledged to have some gaps. Inconsistent mechanisms for follow-up communication with patients in primary care have been documented and emphasized as a concern among those with chronic illness who require close monitoring (Jafar et al., 2020; Bailie et al., 2015). Similar inconsistencies exist between providers, which can lead to unclear care goals, extended hospital stays, and increased medical costs (Bailie et al., 2015; Doetsch et al., 2017). For these reasons, provider-provider communication
composed our third analytic domain. We asked participants to describe the approaches they take to streamline communication after a patient’s hospital visit, the methods they use to ensure collaborative communication between primary or secondary providers, and where communication challenges exist.

4.3 Results

4.3.1 Healthcare provider characteristics

Our sample included 12 providers: four in family medicine (1 MD, 1 DO, 1 PA & 1 APRN), three in pediatrics (2 MD with specialty in hospital medicine & 1 DO), three in palliative medicine (2 MDs & 1 APRN with specialty in wound care), one in critical care medicine (DO with specialty in pediatric pulmonology) and one in behavioral health (1 LCSW with specialty in trauma). Our participants averaged 9 years (range 2-15) as a healthcare provider; most reported more than 5 years in their current professional role. The diversity of participants extended to their patient populations as well, with each participant reporting a unique distribution of age, race and level of medical complexity among their patients. Most participants reported that a portion of their patients travel up to five hours, sometimes across county- or state-lines, to receive care.

4.3.2 Five key themes

Theme 1: A friction exists between aspects of patients’ rural identities and healthcare systems

Our participants comprised a collection of medical professions and reported variability among health-related reasons their patients seek care. However, most participants acknowledged similar characteristics that influence their patients’ challenges to
healthcare access. These identified factors formed categories from which the first theme emerged. There exists a great deal of ‘rugged individualism’ among Montanans, which reflects a self-sufficient and self-reliant way of life. Stoicism marked a primary factor to characterize this quality. One participant explained:

"True Montanans are difficult to treat medically because they tend to be a tough group. They don’t see doctors. They don’t want to go, and they don’t want to be sick. That’s an aspect of Montana that makes health culture a little bit difficult."

Another participant echoed this finding by stating:

"The backwoods Montana range guy who has an identity of being strong and independent probably doesn’t seek out a lot of medical care or take a lot of medications. Their sense of vitality, independence and identity really come from being able to take care and rely on themselves. When that is threatened, that’s going to create a unique experience of illness."

Similar responses were shared by all twelve participants; stoicism seemed to be heavily embedded in many patient populations in Montana and serves as a key determinant of healthcare acceptability. There are additional factors, however, that may interact with stoicism but are multiply determined. Stigma is an example of this, presented in this context as one’s concern about judgement by the healthcare system. Respondents were openly critical of this perception of the healthcare system as it was widely discussed in interviews. One participant stated:

"There is a real perception of a punitive nature in the medical community, particularly if I observe a health issue other than the primary reason for one’s hospital visit, whether that may be predicated on medical neglect, delay of care, or"
something that may warrant a report to social services. For many of the patients and families I see, it’s not a positive experience and one that is sometimes an uphill barrier that I work hard to circumnavigate.

Analysis of these factors suggest that low use of healthcare services may link to several characteristics, including access problems. Separately, a patient’s perceived stigma from healthcare providers may also impact a patient’s willingness to receive services. One participant put it best by stating:

_Sometimes, families assume that I didn’t want to see them because they will come in for follow up to meet with me but end up meeting with another provider, which is frustrating because I want to maintain patients on my panel but available time and resource occasionally limits me from doing so. It could be really hard adapting to those needs on the fly, but it’s an honest miss._

When a patient arrives for a healthcare visit and experiences this frustration, it may elicit a patient’s perceptions of neglect or disorganization. This ‘honest miss’ may, in turn, exacerbate other acceptable-related barriers to care.

**Theme 2:** Facilitating access to healthcare requires application of and respect for cultural differences

The biomedical model is the standard of care utilized in Western medicine (Engel, 1977; Risberg et al., 2006). However, the US comprises people with diverse social and cultural identities that may not directly align with Western conceptions of health and wellness. Approximately 11.5% of the Montana population falls within an ethnic minority group. 6.4% are of American Indian or Alaska Native origin, 0.5% are of Black or African
American origin, 0.8% are of Asian origin and 3.8% are of multiple or other origins (Montana Census & Economic Information Center, 2021). Cultural insensitivity is acknowledged in health services research as an active deterrent for appropriate healthcare delivery (Prasad et al., 2016). Participants for this study were asked how they react when a patient brings up a cultural attitude or behavior that may impact the proposed treatment plan. Eight participants noted a necessity for humility when this occurs. One participant conceptualized this by stating:

When this happens, I learn about individuals and a way of life that is different to the way I grew up. There is a lot of beauty and health in a non-patriarchal, non-dominating, non-sexist framework, and when we can engage in such, it is really expansive for my own learning process.

The participants who expressed humility emphasized that it is best to work in tandem with their patient, congruently. Especially for those with contrasting worldviews, a provider and a patient working as a team poses an opportunity to develop trust. Without it, a patient can easily fall out of the system, further hindering their ability to access healthcare services in the future. One participant stated:

The approach that ends up being successful for a lot of patients is when we understand their modalities, and they have a sense we understand those things. We have to show understanding and they have to trust. From there, we can make recommendations to help get them there, not decisions for them to obey, rather views based on our experiences and understanding of medicine.

Curiosity was another reaction noted by a handful of participants. One participant said:
I believe patients and their caregivers can be engaged and loving in different ways that don’t always follow the prescribed approach in the ways I’ve been trained, but that doesn’t necessarily mean that they are detrimental. I love what I do, and I love learning new things or new approaches, but I also love being surprised. My style of medicine is not to predict peoples’ lives, rather to empower and support what makes life meaningful for them.

Participants mentioned several other characteristics that they use in practice to prevent cultural insensitivity and support a collaborative approach to healthcare. Table 5 lists these facilitating characteristics and quotes to explain the substance of their benefit.

<table>
<thead>
<tr>
<th>Facilitating Characteristics</th>
<th>Representative Quotation</th>
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<tbody>
<tr>
<td>Humility</td>
<td>It’s about having humility and always working on listening.</td>
</tr>
<tr>
<td></td>
<td>There used to be this idea of cultural competence, but that’s moved out the window. We are now working to have cultural humility, to have humbleness in what we do not know.</td>
</tr>
<tr>
<td>Curiosity</td>
<td>One of the reasons I’ve been successful and sustained in this area where a lot of other providers have a really short tenure is because I respond with a lot of curiosity. A lot of things that we do in medicine now are somewhat wise tale or passed along. There’s a real component of culture in healthcare. I see challenges of that in both traditional and non-traditional medicine and often learn a lot from people who have been in the community identified as medicine men or women. In the end, we all have the same goal, right? One trait that is nurtured in our field (social work) and among people who choose our field is empathetic curiosity.</td>
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<tr>
<td>Caution</td>
<td>I am very attentive to cultural elements in healthcare. My entire career has been working around under-privileged, poverty-stricken or racially diverse patients, and I think that I realized the reality of medicine’s shortcomings when it comes to cultural insensitivity.</td>
</tr>
<tr>
<td>Empowered resistance</td>
<td>Reactive anger or resistance doesn’t help anyone, but empowered resistance… those are two separate things. When I hit an edge with people, we talk about their anger and resistance and then we figure out where to go together.</td>
</tr>
<tr>
<td>Alignment</td>
<td>On a pragmatic level, we recognize that when nurturing any relationship and</td>
</tr>
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</table>
developing trust, there first needs to be alignment.

One thing I regularly remind myself of is that it’s not about me. Any tension that I’m feeling is nothing compared to the distrust that the family is feeling. After the pressure is taken off, align, align, align, align, align.

Humor

My goal is to help people become kinder, compassionate, and more open first to themselves, then to other people, so there’s a lot of humor when I reach an edge.

Consensus among participants indicated that the use of these protective factors to promote cultural sensitivity and apply them in practice is not standardized. When asked, all but two participants said they had not received any culturally-based training since beginning their practice. Instead, they referred to developing skills through “on the job training” or “off the cuff learning.” The general way of medicine, one participant remarked, was to “throw you to the fire.” This suggested that use of standardized cultural humility training modules for healthcare providers was not common practice. Many attributed this to time constraints.

Individual efforts to gain culturally appropriate skills or enhance cultural humility were mentioned, however. For example, three participants reported that they attended medical conferences to discuss cultural challenges within medicine, one participant sought out cultural education within their organization, and another was invited by Native American community members to engage in traditional peace ceremonies. Participants described these additional efforts as uncommon and outside the parameters of a provider’s job responsibilities, as they require time commitments without compensation.

Additionally, eight participants said they share their personal contact information with patients so they may call them directly for medical needs. The conditions and frequency with which this is done was variable and more common among providers in specialized areas of medicine or those who described having a manageable patient panel. All who
reported that they shared their personal contact information described it as an aspect of rural health service delivery that is atypical in other, non-rural healthcare systems.

**Theme 3:** Communication between healthcare providers is systematically fragmented

Healthcare is complex and multi-disciplinary, and patients’ treatment is rarely overseen by a single provider (Smith et al., 2013). The array of provider types and specialties is vast, as is the range of responsibilities ascribed to providers. Thus, open communication among providers both within and between healthcare systems is vital for the success of collaborative healthcare (O’Daniel & Rosenstein, 2008). Without effective communication achieved between healthcare providers, the appropriate delivery of healthcare services may be become compromised. Our participants noted that they face multiple challenges that complicate communication with other providers. Miscommunication between departments, often implicating the Emergency Department (ED), was a recurring point noted among participants. One participant who is a primary care physician said:

*If one of my patients goes to the ER, I don’t always get the notes. They’re supposed to send them to the patient’s primary care doc. The same thing happens with general admissions, but again, I often find out from somebody else that my patient was admitted to the hospital.*

This failure to communicate can negatively impact the patient, particularly if time sensitivity or medical complexity is essential to treatment. A patient’s primary care physician is the most accurate source of their medical history; without an effective way to
obtain and synthesize a patient’s health information, there may be increased risk of medical error. One participant in a specialty field stated:

One of the biggest barriers I see is obtaining a concise description of a patient’s history and needs. You can imagine if you’re a mom and you’ve got a complicated kid. You head to the ER. The ER doc looks at you with really wide eyes, not knowing how to get information about your child that’s really important.

This concern was highlighted with a specific example from a different participant:

I have been unable to troubleshoot instances when I send people to the ER with a pretty clear indication for admission, and then they’re sent home. For instance, I had an older fellow with pretty severe chronic kidney disease. He presented to another practitioner in my office with shortness of breath and swelling and appeared to have newly onset decompensated heart failure. When I figured this out, I sent him to the ER, called and gave my report. The patient later came back for follow up to find out not only that they had not been admitted but they lost no weight with outpatient dialysis. I feel like a real opportunity was missed to try to optimize the care of the patient simply because there was poor communication between myself and the ER. This poor guy… He ended up going to the ER four times before he got admitted for COVID-19.

In some cases, communication breakdown was reported as the sole cause of a poor outcome. When communication is effective, each essential member of the healthcare team is engaged and collaborating with the same information. Some participants called this process ‘rounds’ when a regularly scheduled meeting is staged between a group of providers to ensure access to accurate patient information. Accurate communication may
also help build trust and improve a patient’s experience. In contrast, ineffective communication can result in poor clarity regarding providers’ responsibilities or lost information. Appropriate delivery of healthcare considers the fit between providers and a patient’s specific healthcare needs; the factors noted here suggest that provider-provider miscommunication can adversely affect this dimension of healthcare access.

Another important mechanism of communication is the sharing of electronic medical records (EMRs), a process that continues to shift with technological advances. Innovation is still recent enough, however, for several of our study participants to be able to recall a time when paper charts were standard. Widespread adoption and embrace of the improvements inherent in EMRs expanded in the late 2000’s (Evans, 2016). EMRs vastly improved the ability to retain, organize, safeguard, and transfer health information. Every participant highlighted EMRs at one point or another and often did so with an underlying sense of anger or frustration. Systematic issues and problems with EMRs were discussed.

One participant provided historical context to such records:

*Years back, the government aimed to buy an electronic medical record system, whichever was the best, and a number of companies created their own. Each was a reasonable system, so they all got their checks and now we have four completely separate operating systems that do not talk to each other. The idea was to make a router or some type of relay that can share information back and forth. There was no money in that though, so of course, no one did anything about it. Depending on what hospital, clinic or agency you work for, you will most likely work within one of these systems. It was a great idea; it just didn’t get finished.*
Seven participants confirmed these points and their impacts on making coordination more difficult, relying on outdated communication strategies more often than not. Many noted this even occurs between facilities within the same city, and in separate small metropolitan areas across the state. One participant said:

> If my hospital decides to contract with one EMR and the hospital across town contracts with another, correspondence between these hospitals goes back to traditional faxing. As a provider, you’re just taking a ‘finger crossed’ approach hoping that the fax worked, is picked up, was put in the appropriate inbox and was actually looked at. Information acquisition and making sure it’s timely are unforeseen between EMRs.

Participants reported an “astronomic” number of daily faxes and telephone calls to complete the communication EMRs were initially designed to handle. These challenges are even more burdensome if a patient moves from out of town or out of state; obtaining their medical records was repeatedly referred to as a “chore” so onerous that it often remains undone. Another recurring concern brought up by participants regarded accuracy within EMRs to lend a false sense of security. They are not frequently updated, not designed to be family-centered and not set up to do anything automatically. One participant highlighted these limitations by stating:

> I was very proud of a change I made in our EMR system [EPIC], even though it was one I never should have had to make. I was getting very upset because I would find out from my nursing assistant who read the obituary that one of my patients had died. There was a real problem with the way the EMR was notifying PCP’s, so I got an EPIC-level automated notification built into our EMR so that any time a
patient died, their status would be changed to deceased and a notification would be sent to their PCP. It’s just really awful to find out a week later that your patient died, especially when you know these people and their families really well. It’s not good care to have blind follow up.

Whether it be a physical or electronic miscommunication between healthcare providers, the appropriate delivery of healthcare can be called to question.

**Theme 4:** Time and resource constraints disproportionately harm rural health systems

Several measures of system capacity suggest the healthcare system in the US is under-resourced. There are fewer physicians and hospital beds per capita compared to most comparable countries, and the growth of healthcare provider populations has stagnated over time (Kaiser Family Foundation, 2020). Rural areas, in particular, are subject to resource limitations (Government Accounting Office, 2017). All participants discussed provider shortages in detail. They described how shortages impact time allocation in their day-to-day operations. Tasks like patient intakes, critical assessments, and recovering information from EMRs take time, of which most participants claimed to not have enough of. There was also a consensus in having inadequate time to spend on medically complex cases. Time pressures were reported to subsequently influence quality of care. One participant stated:

*With the constant pace of medicine, time is not on your side. A provider cannot always participate in an enriching dialogue with their patients, so rather than listen and learn, we are often coerced into the mindset of ‘getting through’ this patient so we can move on. This echoes for patient education during discharge,*
making the whole process more arduous than it otherwise could be if time and resources were not as sparse.

Depending on provider type, specialty, and the size of patient panels, four participants said they have the luxury of extending patient visits to 40+ minutes. Any flexibility with patient visits was regarded as just that: a luxury. Very few providers described the ability to coordinate their schedules as such. This led some study participants to limit the number of patients they serve. One participant said:

*We simply don’t have enough clinicians, which is a shame because these people are really skilled, exceptional, brilliant providers but are performing way below their capacity. Because of this, I have a smaller case load so I can engage in a level of care that I feel is in the best interest of my patients. Everything is a tradeoff. Time has to be sacrificed at one point or another. This compromise sets our system up to do ‘ok’ work, not great work.*

Of course, managing an overly large number of patients with high complexity is challenging. Especially while enduring the burden of a persisting global pandemic, participants reflected that the general outlook of administering healthcare in the US is to “do more with less.” This often forces providers to delegate responsibilities, which participants noted has potential downsides. One participant described how delegating patient care can cause problems.

*Very often will a patient schedule a follow up that needs to happen within a certain time frame, but I am unable to see them myself. So, they are then placed with one of my mid-level providers. However, if additional health issues are introduced, which often happens, there is a high-risk of bounce-back or need to return once*
again to the hospital. It’s an inefficient vetting process that falls to people who may not have specific training in the labs and imaging that are often included in follow up visits. Unfortunately, it’s a forlorn hope to have a primary care physician be able to attend all levels of a patient’s care.

Several participants described how time constraints stretch all healthcare staff thin and complicate patient care. This was particularly important among participants who reported having a patient panel exceeding 1000. There were some participants, however, who praised the relationships they have with their nurse practitioners and physician’s assistants and mark transparency as the most effective way to coordinate care. Collectively, these collaborative clinical relationships were built over long standing periods of time, a disadvantage to providers at the start of their medical career. All but one participant with over a decade of clinical experience mentioned the usefulness of these relationships. The factors discussed in Theme 4 are directly linked to the Availability dimension of access to healthcare. A patient’s ability to reach care is subject to the capacity of their healthcare provider(s). Additionally, further analysis suggests these factors also link to the Appropriateness dimension because the quality of patient-provider relationships may be negatively impacted if a provider’s time is compromised.

**Theme 5:** Profits are prioritized over addressing barriers to healthcare access in the US.

The US healthcare system functions partially for-profit in the public and private sectors. The federal government provides funding for national programs such as Medicare, but a majority of Americans access healthcare through private employer plans (Tikkanen et al., 2020). As a result, un-insurance rates influence healthcare access. Though the rate of the
uninsured has dropped over the last decade through expansion of the Affordable Care Act, it remains above 8 percent (Berchick et al., 2019). Historically, there has been ethical criticism in the literature of a for-profit system as it is said to exacerbate healthcare disparities and constitute unfair competition against nonprofit institutions. Specifically, the US healthcare system treats healthcare as a commodity instead of a right, enables organizational controls that adversely affect patient-provider relationships, undermines medical education, and constitutes a medical-industrial complex that threatens influence on healthcare-related public policy (Brock & Buchanan, 1986).

Though unprompted by the interviewer, participants raised many of these concerns. One participant shared their views on how priorities stand in their practice:

*A lot of the higher-ups in the healthcare system where I work see each patient visit as a number. It’s not that they don’t have the capacity to think beyond that, but that’s what their role is, making sure we’re profitable. That’s part of why our healthcare system in the US is as broken as it is. It’s accentuated focus on financially and capitalistically driven factors versus understanding all these other barriers to care.*

Eight participants echoed a similar concept, that addressing barriers to healthcare access in their organizations is largely complicated because so much attention is directed on matters that have nothing to do with patients. A few other participants supported this by alluding to a “cherry-picking” process by which those at the top of the hierarchy devote their attention to the easiest tasks. One participant shared an experience where contrasting work demands between administrators and front-line clinical providers produces adverse effects:
We had a new administrator in our hospital. I had been really frustrated with the lack of cultural awareness and curiosity from our other leaders in the past, so I offered to meet and take them on a tour of the reservation. This was meant to introduce them to kids, families and Tribal leaders who live in the area and their interface with healthcare. They declined, which I thought was disappointing and eye-opening.

Analysis of these factors suggest that those who work directly with patients understand patient needs better than those who serve in management roles. This same participant went on to suggest an ulterior motive for a push towards telemedicine, as administrators primarily highlight the benefit of billing for virtual visits instead of the nature of the visits themselves.

4.4 Discussion

This study explored barriers and facilitators to healthcare access from the perspective of rural healthcare providers in Montana. Our qualitative analysis uncovered five key themes: 1) a friction exists between aspects of patients’ rural identities and healthcare systems; 2) facilitating access to healthcare requires application of and respect for cultural differences; 3) communication between healthcare providers is systematically fragmented; 4) time and resource constraints disproportionately harm rural health systems; and 5) profits are prioritized over addressing barriers to healthcare access in the US. Themes 2 and 3 were directly supported by earlier qualitative studies that applied Levesque’s framework, specifically regarding healthcare providers’ poor interpersonal quality and lack of collaboration with other providers that are suspected to result from a lack of provider training (Romanelli & Hudson, 2017; Swan et al., 2020). This ties back
to the importance of cultural humility, which many previous culture-based trainings have referred to as cultural competence. Cultural competence is achieved through a plethora of trainings designed to expose providers to different cultures’ beliefs and values but induces risk of stereotyping and stigmatizing a patient’s views. Therefore, cultural humility is the preferred idea, by which providers reflect and gain open-ended appreciation for a patient’s culture (Lekas et al., 2020).

4.4.1 Implications for Practice

Perhaps the most substantial takeaway is how embedded rugged individualism is within rural patient populations and how difficult that makes the delivery of care in rural health systems. We heard from participants that stoicism and perceptions of stigma within the system contribute to this, but other resulting factors may be influential at the provider- and organizational-levels. Stoicism and perceived stigma both appear to arise, in part, from an understandable knowledge gap regarding the care system. For instance, healthcare providers understand the relations between primary and secondary care, but many patients may perceive both concepts as elements of a single healthcare system (Beaulieu, 2013). Any issue experienced by a patient when tasked to see both a primary and secondary provider may result in a patient becoming confused (Crafford & Jenkins, 2017). This may also overlap with our third theme, as a disjointed means of communication between healthcare providers can exacerbate patients’ negative experiences. One consideration to improve this is to incorporate telehealth programs into an existing referral framework to reduce unnecessary interfacility transfers; telehealth programs have proven effective in rural and remote settings (Sorensen et al., 2013).
In fact, telehealth has been rolled out in a variety of virtual platforms throughout its evolution, its innovation matched with continued technological advancement. Simply put, telehealth allows health service delivery from a distance; it allows knowledge and practice of clinical care to be in a different space than a patient. Because of this, a primary benefit of telehealth is its impact on improving patient-centered outcomes among those living in rural areas. For instance, text messaging technology improves early infant diagnosis, adherence to recommended diagnostic testing, and participant engagement in lifestyle change interventions (Sutcliffe et al., 2017; Baldwin et al., 2017; Albright et al., 2015). More sophisticated interventions have found their way into smartphone-based technology, some of which are accessible even without an internet connection (Cramer et al., 2018; Gbadamosi et al., 2018). Internet accessibility is important because a number of study participants noted internet connectivity as a barrier for patients who live in low resource communities. Videoconferencing is another function of telehealth that has delivered a variety of health services, including those which are mental health-specific (Trondsen et al., 2018), and mobile health clinics have been used in rural, hard-to-reach settings to show that the delivery of quality healthcare is both feasible and acceptable (Schwitter et al., 2015; Kojima et al., 2017; Gorman et al., 2015). While telehealth has potential to reduce a number of healthcare access barriers, it may not always address the most pressing healthcare needs (Lee et al., 2019). However, telehealth does serve as a viable, cost-effective alternative for rural populations with limited direct or physical access to specialized services (Agha et al., 2002). With time and resource limitations acknowledged as a key theme in our study, an emphasis on expanding telehealth services
is encouraged as it will likely have significant involvement on advancing healthcare in the future, especially as the COVID-19 pandemic persists (Doraiswamy et al., 2020).

4.4.2 Implications for Policy

One could argue that most of the areas of fragmentation in the US healthcare system can be linked to the very philosophy on which it is based: an emphasis on profits as highest priority. Americans are, therefore, forced to navigate a health service system that does not work solely in their best interests. It is not surprising to observe lower rates of healthcare usage in rural areas, which may be a result from rural persons’ negative views of the US healthcare system or a perception that the system does not exist to support wellness. These perceptions may interact with ‘rugged individualism’ to squelch rural residents’ engagement in healthcare. Many of the providers we interviewed for this study appeared to understand this and strived to improve their patients’ experiences and outcomes. Though these efforts are admirable, they may not characterize all providers who serve in rural areas of the US. From a policy standpoint, it is important to recognize these expansive efforts from providers. If incentives were offered to encourage maximum efforts be made, it may lessen burden due to physician burnout and fatigue. Of course, there is no easy fix to the persisting limit of time and resources for providers, problems that require workforce expansion. Ultimately, though, the current structure of the US healthcare system is failing rural America and doing little to help the practice of rural healthcare providers.
4.4.3 Implications for Future Research

It is important for future health systems research efforts to consider issues that arise from both individual- and system-level access barriers and where the two intersect. Oftentimes, challenges that appear linked to a patient or provider may actually stem from an overarching system failure. If failures are critically and properly addressed, we may refine our understanding of what we can do in our professional spaces to improve care as practitioners, workforce developers, researchers and advocates. This qualitative study was exploratory in nature. It represents a step forward in knowledge generation regarding challenges in access to healthcare for rural Americans. Although mental health did not come up by design in this study, future efforts exploring barriers to healthcare access in rural systems should focus on access to mental healthcare. In many rural areas, Montana included, rates of suicide, substance use and other mental health disorders are highly prevalent. These characteristics should be part of the overall discussion of access to healthcare in rural areas. Optimally, barriers to healthcare access should continue to be explored through qualitative and mixed study designs to honor its multi-dimensional stature.

4.4.4 Strengths and Limitations

It is important to note first that this study interviewed healthcare providers instead of patients, which served as both a strength and limitation. Healthcare providers were able to draw on numerous patient-provider experiences, enabling an account of the aggregate which would have been impossible for a patient population. However, accounts of healthcare providers’ perceptions of barriers to healthcare access for their patients may
differ from patients’ specific views. Future research should examine acceptability- and appropriateness-related barriers to healthcare access in patient populations. Second, study participants were recruited through convenience sampling methods, so results may be biased towards healthcare providers who are more invested in addressing barriers to healthcare access. Particularly, the providers interviewed for this study represented a subset who go beyond expectations of their job descriptions by engaging with their communities and spending additional uncompensated time with their patients. It is likely that a provider who exhibits these behavioral traits is more likely to participate in research aimed at addressing barriers to healthcare access. Third, the inability to conduct face-to-face interviews for our qualitative study may have posed an additional limitation. It is possible, for example, that in-person interviews might have resulted in increased rapport with study participants. Notwithstanding this possibility, the remote interview format was necessary to accommodate health risks to the ongoing COVID-19 pandemic. Ultimately, given our qualitative approach, results from our study cannot be generalizable to all rural providers’ views or other rural health systems. In addition, no causality can be inferred regarding the influence of aspects of rurality on access. The purpose of this exploratory qualitative study was to probe research questions for future efforts. We also acknowledge the authors’ roles in the research, also known as reflexivity. The first author was the only author who administered interviews and had no prior relationships with all but one study participant. Assumptions and pre-dispositions to interview content by the first author were regularly addressed throughout data analysis to maintain study integrity. This was achieved by conducting analysis by unique interview question, rather than by unique participant, and recoding the numerical order of participants for each question.
Our commitment to rigorous qualitative methods was a strength for the study for multiple reasons. Conducting member checks with participants ensured trustworthiness of findings. Continuing data collection to data saturation ensured dependability of findings, which was achieved after 10 interviews and confirmed after 2 additional interviews. We further recognize the heterogeneity in our sample of participants, which helped generate variability in responses. To remain consistent with appropriate means of presenting results in qualitative research however, we shared minimal demographic information about our study participants to ensure confidentiality.

4.5 Conclusion

The divide between urban and rural health stretches beyond a disproportionate allocation of resources. Rural health systems serve a more complicated and hard-to-reach patient population. They lack sufficient numbers of providers to meet population health needs. These disparities impact collaboration between patients and providers as well as the delivery of acceptable and appropriate healthcare. The marker of rurality complicates the already cumbersome challenge of administering acceptable and appropriate healthcare and impediments stemming from rurality require continued monitoring to improve patient experiences and outcomes. Our qualitative study explored rural healthcare providers’ views on some of the social, cultural, and programmatic factors that influence access to healthcare among their patient populations. We identified five key themes: 1) a friction exists between aspects of patients’ rural identities and healthcare systems; 2) facilitating access to healthcare requires application of and respect for cultural differences; 3) communication between healthcare providers is systematically fragmented; 4) time and
resource constraints disproportionately harm rural health systems; and 5) profits are prioritized over addressing barriers to healthcare access in the US. This study provides implications that may shift the landscape of a healthcare provider’s approach to delivering healthcare. Further exploration is required to understand the effects these characteristics have on measurable patient-centered outcomes in rural areas.
Chapter 5: Associations between the density of healthcare providers and county-level suicide rates in Montana: an ecological study

Abstract

Background. Suicide has increased over 35% in the United States since 2000 and is a major public health concern, especially in rural areas where suicide is disproportionately higher than in urban areas. One contributing factor to this rural-urban disparity may be limited access to primary and mental healthcare services in rural areas. The state of Montana serves as a good example of healthcare provider- and suicide-related disparities. It is the fourth largest state in area and the third least densely populated. Montana ranks the worst in the US for projected healthcare provider shortages over the next decade, and Montana has had one of the highest rates of suicide nationally over decades.

Methods. We used an ecological study design to measure the association between the density of healthcare providers and suicide rates across counties in the state of Montana. Data were collected from three sources: WIM Tracking, the Montana Department of Health and Human Services, and the American Community Survey. Information collected included up-to-date records of healthcare providers, suicide and demographic population-level characteristics, respectively. We calculated county-level density measures for three groups of healthcare providers: primary healthcare providers, mental healthcare providers, primary and mental healthcare providers combined. Multiple linear regression analyses were used to identify characteristics that associate with suicide rates.

Results. The number of primary healthcare providers ranged from 0.0 to 2.6 per 1,000 persons, and the number of mental healthcare providers ranged from 0.0 to 3.2 per 1,000 persons. Age-adjusted suicide rates ranged from 0.0 to 39.8 per 100,000 persons; 51 (91%) of the 56 counties in Montana reported a suicide rate that exceeded the current national average. Education attainment, foreign-born status, vehicle and internet accessibility, and median value of home were significantly associated with suicide rates at the county-level. These estimates had the strongest predictive power when controlling for primary healthcare providers compared to when controlling for mental healthcare providers and primary and mental healthcare providers together.

Conclusions. This study examined the association between the density of healthcare providers and suicide rates in Montana counties. Future population-based health systems research that examines density of healthcare providers and suicide should pair information across multiple rural regions of the US to increase the scientific rigor and generalizability of findings to rural America.

Keywords – Rural Health, Healthcare Provider Shortages, Suicide
5.1 Background

The increase of suicide in the United States is a major public health concern. Since 1999, the overall age-adjusted rate of suicide increased more than 35% in the general US population (Hedegaard et al., 2020). Although the increase of suicide is evident across most demo- and socio-graphic populations, there is a distinct geographic disparity, as persons who reside in rural areas of the US have seen a disproportionate increase in suicide compared to urban areas (Ivey-Stephenson et al., 2017). The gap between trends in suicide for rural and urban areas has widened over time, particularly in the most rural parts of the country (Kegler et al., 2017). The Centers for Disease Control and Prevention acknowledges that an understanding of suicide trends by urbanization level can help identify geographic areas of highest risk and focus prevention efforts (Kegler et al., 2017).

Geographic disparities in suicide rates between rural and urban areas may be associated with suicide risk factors that are known to be highly prevalent in rural areas, such as limited access to primary and mental healthcare services (Health Resources and Services Administration, 2017). When evaluating healthcare systems, access to healthcare is treated as a primary indicator, and the number of healthcare providers per capita is often included in such criteria (Kaiser Family Foundation, 2020). A negative linear association exists between the density of healthcare providers and suicide according to a national, state-wide ecological study conducted in the US (Tondo et al., 2006). In other words, areas with more healthcare providers per capita tend to experience lower rates of suicide. Limited access to services may be made worse by a growing shortage of healthcare providers. A recent study developed a comprehensive model that forecasted physician
shortage in the US over the next decade and estimated more than half of US states will be burdened by physician shortages along with a total national deficit of 139,160 physician jobs by the year 2030 (Zhang et al., 2020). As a result, health system researchers emphasized an increase in the number of healthcare providers to practice in rural areas (Fifolt et al., 2020; Patel et al., 2017). However, there remains limited movement in addressing the collective, inequitable distribution of healthcare providers across the US, so rural areas remain hard-pressed with healthcare provider shortages (Grobler et al., 2015).

The US state of Montana is a strong representation of these healthcare provider- and suicide-related disparities. Montana lies in the northwest part of the country directly south of Alberta, Canada. Montana is the fourth largest US state with an area of 380,831 km$^2$, exceeding the total land mass of almost 70% of all sovereign nations (Central Intelligence Agency, 2021). With just over one million residents, it is also the third least densely populated state in the US (Health Resources and Services Administration, 2021). Over 80% of Montana counties are classified at the lowest level of urban-rural classification, which parallels a common characterization known as ‘frontier’ or having fewer than approximately 3 people/km$^2$ and is a threshold met by only nine counties and territories in the world (Ingram & Franco, 2014). According to Zhang et al., Montana’s healthcare provider shortage status currently ranks among the worst in the US (Zhang et al., 2020). By the year 2030, Montana is estimated to have 894 fewer physician jobs than what is required to meet population needs (Zhang et al., 2020). Montana has maintained one of the highest rates of suicide for any US state over the last 40 years. In 2019, the suicide rate in Montana was 26.2 per 100,000 persons (National Center for Health
Statistics, 2021). If it were its own country, Montana would rank 7th in suicide worldwide exceeded only by Lesotho, Guyana, Eswatini, South Korea, Kiribati and Micronesia (World Health Organization, 2021).

To our knowledge, no studies have investigated the association between the density of healthcare providers and suicide rates in the state of Montana, of which a comprehensive exposure assessment of density of healthcare providers is applied. To address this gap in the literature, this study aimed to examine the association between the density of healthcare providers and suicide rates for Montana counties and investigate if other population characteristics influence suicide rates.

5.2 Methods

5.2.1 Study Design

We used an ecological study design to measure the association between the density of healthcare providers at the county-level and suicide rates in the state of Montana, controlling for the effects of population-level demo- and sociographic characteristics. Suicide is a rare outcome, and ecological studies are often used to measure the prevalence of a disease or health outcome when such an event is rare (Szklo & Nieto, 2019). Additionally, public records of suicide are often reported at the regional level. This further supports use of an ecological design to analyze suicide across populations instead of an individual-level analysis.

5.2.2 Data Collection

5.2.2.1 Healthcare Provider Data

Data for this study were collected from three sources. The first source was WIM Tracking, a health workforce information services company that organizes health
workforce data collection, surveying, reporting, geographical mapping and assessment
building for health systems that operate out of Wyoming, Idaho and Montana (WIM
Tracking, 2021). WIM Tracking provided records of the status and location(s) of primary
healthcare and mental healthcare providers who practice in the state of Montana as of
January 2021, the time at which these data were collected. The definitions for provider
groups, as discussed in sections 5.2.3.1 and 5.2.3.2, were used to determine inclusion
criteria for analysis unique to a standard designation process. The following variables
were obtained: provider type, specialty, practice name, city, state, zip code and county.
Study investigators used these provider data to produce a count of all unique provider
types and specialties for each of Montana’s 56 counties. Provider-to-patient ratios (per
1,000 persons) for each Montana county were calculated based on 2021 county
population estimates (United States Census Bureau, 2021).

5.2.2.2 Suicide Data

Suicide mortality data were collected from the Office of Vital Statistics (OVS), Montana
Department of Health and Human Services (DPHHS). OVS maintains accurate and
timely registration of vital events, which include all birth and death records in the state of
Montana. Vital records are cross-validated in accordance with the National Center for
Health Statistics, Center for Disease and Control and Prevention (Montana Department of
Health and Human Services, 2021). Suicide mortality was defined under ICD-10 codes
for injury, intentional self-harm (suicide) [X60-X84, Y87.9, *U03] listed on death
certificates. Records were collected for the years 2003-2019, which included age and
county of residence. The US 2000 standard population was used for age standardization,
as consistent with the current age-adjustment method used by DPHHS (Klein &
Schoenborn, 2001). The 2000 standard population also reflects the age distribution across Montana counties that closely precedes the time period of suicide data collection.

5.2.2.3 Demographic and Sociographic Data

County-level demographic and sociographic data were collected from the American Community Survey (ACS). The ACS is an ongoing survey conducted by the US Census Bureau that collects information about the social and economic needs of American communities, which include education, housing and employment (United States Census Bureau [2], 2022). We summarized 5-year estimates of several population-level characteristics for Montana counties from the most recent years available at the time of data collection, 2014-2018. Variables included county-level distributions for age, sex, race, marital status, education attainment, veteran status, foreign-born status, employment status, health insurance coverage, poverty status, household income, vehicle accessibility, internet accessibility, and value of home. The a priori selection of these population characteristics was developed in part though deductive synthesis of literature that previously identified risk factors for suicide. For example, education attainment and veteran status are strongly associated with suicide risk (Phillips & Hempstead, 2017, US Department of Veterans Affairs, 2022). Many sociographic characteristics are known to associate with suicide, including unemployment, lack of health insurance coverage, and poverty, and others provide a measurement across other levels of socioeconomic standing, like household income and value of home (Kaufman et al., 2020, Tondo et al., 2006, Hoffman et al., 2020). Marital status was applied as a proxy indicator of social isolation, which is a well-documented risk factor for suicide (Cantor & Slator, 1995, Kposowa, 2000, Thoresen et al., 2006). Age, sex and race were included as standard
prespecified variables of interest (Flanagin et al., 2021). We also included variables that were considered contextually relevant for rural Montana communities, like vehicle and internet accessibility (Ivey-Stephenson et al., 2017).

5.2.3 Exposure Definition

5.2.3.1 Primary Healthcare Providers

The American Academy of Family Physicians (AAFP) provides a comprehensive definition for primary care physicians, which was used to define inclusion criteria to measure the density of healthcare providers for this study. Primary care is the provision of integrated, accessible healthcare services by physicians and their healthcare teams who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing in the context of family and community. Primary care physicians specifically are trained for and skilled in comprehensive, first contact, and continuing care for the undifferentiated patient with any undiagnosed sign, symptom, or health concern not limited by problem origin, organ system, or diagnosis. A primary care practice serves as the patient’s entry point into the healthcare system and as the continuing focal point for all needed healthcare services (American Academy of Family Physicians, 2021). A primary care physician is a specialist in family medicine, general internal medicine, general pediatrics or obstetrics and gynecology (OBGYN) (Mazzoni et al., 2017). The AAFP uses the term ‘physician’ to refer only to doctors of medicine (MDs) and osteopathy (DOs). However, physician assistants (PAs) and advanced practice registered nurses (APRNs) also administer primary care services to meet the needs of specific patients. To accommodate this, we used the term ‘provider’ rather than ‘physician’ to denote all primary care providers.
accessed by rural populations. Providers without training in the primary care specialties of family medicine, general internal medicine, general pediatrics or obstetrics and gynecology may sometimes provide patient care services that primary care physicians usually deliver. However, these physicians do not offer these services within the context of comprehensive, first contact and continuing care. Non-primary care physicians’ contributions may be necessary to meet specific patient needs. However, the absence of full-scope primary care training requires that these individuals work in close consultation with primary care physicians. An effective primary care system may utilize these physicians as members of the healthcare team while a primary care physician maintains responsibility for the team's success and the comprehensive, ongoing care of the patient (American Academy of Family Physicians, 2021). For these reasons, this study defined primary healthcare providers as any physician, PA or APRN with a specialty in family medicine, general internal medicine, pediatrics or OBGYN.

5.2.3.2 Mental Healthcare Providers

The World Health Organization (WHO) notes that health encompasses the composite union of physical, spiritual, mental, and social dimensions, which recognizes that mental health is fundamental to quality of life (Mishra & Galhotra, 2018; World Health Organization, 2022). Mental Health is integral and essential to the overall health of a population. Thus, we characterized a second population of providers for this study: mental healthcare providers. Providing mental healthcare involves diagnosing and treating people with mental disorders, putting in place strategies to prevent mental disorders and ensuring that healthcare workers are able to apply key psychosocial and behavioral science skills (What is primary care mental health, 2008). Among these
include interviewing, counseling and interpersonal skills in their day-to-day work in order to improve overall health outcomes. The WHO defines mental healthcare as treatment of mental disorders, including psychological therapy for disorders such as depression, medication management for a myriad of disorders, psychosocial support and care, and treatment of substance use disorders (World Health Organization, 2022). The mental health continuum of care contains several disciplines, including psychiatry. Psychiatry is a medical specialty whose practitioners focus on the diagnosis, treatment, and prevention of mental, emotional, and behavioral disorders (National Alliance on Mental Illness, 2022; American Psychiatric Association, 2022). Psychiatry is a specialty that can be affiliated with any of the aforementioned healthcare provider types (i.e., physicians, PAs, APRNs). In addition to psychiatry, several types of mental health professionals provide services across the spectrum of mental and behavioral health (Alegría et al., 2021). Mental Health America identifies the following disciplines as those that can provide therapy, counseling, and with appropriate training, assessments: Licensed Professional Counselors (LPCs), Licensed Clinical Social Workers (LCSWs) and Psychologists (Mental Health America, 2022). This study defined mental healthcare providers as any physician, PA or APRN with a specialty in psychiatry or any LCPC, LCSW or Clinical or Counseling Psychologist.

5.2.4 Statistical Analysis

Descriptive statistics were used to characterize the study sample and multiple linear regression analyses were used to explore the relationship between the density of healthcare providers and suicide while controlling for the effects of demographic and sociographic characteristics of interest. Univariate regression analyses between each
provider group and suicide rates and the relationships between provider groups was compared with the Pearson correlation coefficient, \( r \), which measures the strength of a linear relationship between two continuous variables. Multivariable regression models were compared for best fit through the backward stepwise selection method, which started with all predictor variables in the model and iteratively removing the least contributing variables one by one. Removed variables were cycled through the model a second time to measure their impact on main effect variables that remained included. Variables that met model parameter thresholds (\( p < 0.05 \)) were included in the final models. Model fit was assessed with Nagelkerke’s pseudo \( R^2 \) statistic, a measure of the percent of variability across all variables that is explained in the model (Nagelkerke, 1991). Higher \( R^2 \) values represent a stronger, more predictive model. The density of healthcare providers was explored through three different provider groups: 1) primary healthcare providers, 2) mental healthcare providers, and 3) total healthcare providers (primary healthcare providers + mental healthcare providers). Demographic and sociographic variables that were collected from the ACS were controlled for in regression analyses. To simplify interpretation of each ACS variable, they were collapsed to median values or percentages and treated as continuous. All analyses were performed using R statistical software version 4.0.5. Descriptions of these variables are provided in section 3.0.

5.3 Results

A total of 3,129 Montana healthcare providers met inclusion criteria; 1,373 were classified as primary healthcare providers and 1,756 were classified as mental healthcare providers. Among primary healthcare providers, 974 (71%) have a specialty in Family
Medicine (306 APRNs, 453 Physicians, 215 PAs), 127 (9%) have a specialty in Internal Medicine (17 APRNs, 105 Physicians, 5 PAs), 151 (11%) have a specialty in Obstetrics and Gynecology (36 APRNs, 103 Physicians, 12 PAs), and 121 (9%) have a specialty in Pediatrics (23 APRNs, 97 Physicians, 1 PA). Among mental healthcare providers, 1,551 (88%) have a specialty in Behavioral Health (865 LCPCs, 523 LCSWs, 161 Psychologists, 2 APRNs, 2 Physicians, 2 PAs) and 205 (12%) have a specialty in Psychiatry (103 APRNs, 93 Physicians, 9 PAs). Patient-to-provider ratios across Montana counties ranged from 0 to 2.6 primary healthcare providers per 1,000 persons and 0 to 3.2 mental healthcare providers per 1,000 persons. Between 2003 and 2019, a total of 3,830 suicide cases were identified in Montana. Age-adjusted suicide rates for each Montana county ranged from 0 to 39.8 per 100,000 persons, and 51 of the 56 counties exceeded the current national average. Descriptive statistics for providers groups, suicide and each ACS population-level estimate are included in Table 6.

| Table 6. Descriptive statistics of density of healthcare providers, suicide rates, and population characteristics for Montana Counties |
|---|---|---|---|
| Variable | Mean (Std. Dev) | Median | Range |
| Suicide Rates | 22.6 (7.7) | 22.5 | 0.0 – 39.8 |
| Primary Outcome Variable, Age-adjusted suicide rate per 100,000 persons |
| Density of Primary Healthcare Providers | 1.3 (0.6) | 1.3 | 0.0 – 2.6 |
| Primary Independent Variable, Number of primary healthcare providers per 1,000 persons |
| Density of Mental Healthcare Providers | 0.8 (0.8) | 0.6 | 0.0 – 3.2 |
| Primary Independent Variable, Number of mental healthcare providers per 1,000 persons |
| Density of Total Healthcare Providers | 2.1 (1.0) | 2.1 | 0.0 – 4.4 |
| Primary Independent Variable, Number of primary + mental healthcare providers per 1,000 persons |
| Age | 44.6 (6.6) | 45.6 | 30.3 – 56.0 |
| Median age (in years) from the total population of a county |
| Sex | 49.6% (2.7) | 50.3% | 35.2% – 52.1% |
| Percent of county population 18 years and older who are female |
| Race | 9.4% (16.2) | 3.5% | 0.0% – 66.7% |
| Percent of total county population that does not identify as White (Black or Afr. Am., AIAN, Asian, NHPI, Some other race) |
| Marital Status | 55.3% (7.0) | 55.4% | 35.8% – 71.3% |
| Percent of county population 15 years and older that is “now married, except separated” |
| Education Attainment | 91.9% (4.1) | 92.9% | 75.0% – 98.8% |
| Percent of county population 25 years and older that has at least a high school diploma (includes equivalency) |
| Veteran Status | 10.8% (2.8) | 10.0% | 5.9% – 17.4% |
| Percent of county civilian population 18 years and older that are civilian veterans |
| Foreign-born Status | 1.7% (0.9) | 1.5% | 0.0% – 4.2% |
| Percent of county population that was foreign born (not in US or US territory) |
| Employment Status | 4.3% (3.2) | 3.6% | 0.0% – 15.2% |
Percent of county population 16 years and older that is in the labor force and unemployed

<table>
<thead>
<tr>
<th>Health Insurance Coverage</th>
<th>11.3% (6.5)</th>
<th>10.0%</th>
<th>2.8% - 38.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of the civilian noninstitutionalized population in a county that has no health insurance coverage</td>
<td>14.2% (6.0)</td>
<td>13.7%</td>
<td>4.2% - 33.3%</td>
</tr>
</tbody>
</table>

Household Income

<table>
<thead>
<tr>
<th>Household Income</th>
<th>49,418 (7,878)</th>
<th>48,545</th>
<th>31,029 – 67,272</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median household income (in 2018 inflation-adjusted dollars)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vehicle Accessibility

<table>
<thead>
<tr>
<th>Vehicle Accessibility</th>
<th>4.5% (2.7)</th>
<th>4.0%</th>
<th>0.0% - 14.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of occupied housing units in a county that do not have access to a vehicle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Internet Accessibility

<table>
<thead>
<tr>
<th>Internet Accessibility</th>
<th>72.8% (6.2)</th>
<th>72.8%</th>
<th>54.5% - 86.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of total households in a county that have a broadband Internet subscription in their home</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Value of Home

<table>
<thead>
<tr>
<th>Value of Home</th>
<th>168,363 (59,289)</th>
<th>146,400</th>
<th>89,800 – 330-400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median value of home (in dollars) from all owner-occupied units in a county</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Std. Dev = Standard Deviation, Afr. Am. = African American, AIAN = American Indian or Alaska Native, NHPI = Native Hawaiian and other Pacific Islander.

In univariate analyses, no significant associations were found between the density of healthcare providers and suicide rates for any of the three provider groups. The strongest linear association was between density of primary healthcare providers and county-level suicide rates. The correlation coefficient between these two variables (r=0.189) indicate a weak positive linear association. A list of results from each univariate analysis and multivariable regression analysis is included in Table 7. Crude analyses refer to the univariate analyses with each provider group and suicide rates. Model #1 refers to multivariable analyses that used the density of primary healthcare providers as the primary independent variable of interest, Model #2 refers to multivariable analyses that used the density of mental healthcare providers as the primary independent variable of interest, and Model #3 refers to multivariable analyses that used the density of total healthcare providers as the primary independent variable of interest. There was a weak linear association found between the density of primary healthcare providers and the density of mental healthcare provider across Montana counties (r=0.114). This was done to ensure Model #1 and Model #2 would not yield the same results. Several characteristics were significantly associated with county-level suicide rates across all
models, including education attainment, foreign-born status, vehicle and internet accessibility and value of home. These results suggest that while controlling for the effects of all provider groups, counties with a higher rate of citizens with at least a high school diploma, a higher rate of those born outside the US and a higher rate of homes with sufficient internet access associate with lower rates of suicide. Alternatively, lack of access to a vehicle and higher value of homes associate with higher rates of suicide.

These effects were explained the most in Model #1, which included the density of primary healthcare providers. Race and poverty status were also and only significant in Model #1. Approximately 15.95% of the overall variance across these characteristics were explained in Model #1. Model #2 included the density of mental healthcare providers and yielded similar, yet weaker results.

Table 7. Results from crude and adjusted linear regression analyses for suicide rates among Montana counties.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Crude Analysis</th>
<th>Model #1</th>
<th>Adjusted Analysis</th>
<th>Model #2</th>
<th>Model #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of Primary Healthcare Providers</td>
<td>2.40</td>
<td>4.09 **</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Density of Mental Healthcare Providers</td>
<td>0.73</td>
<td>--</td>
<td>1.58</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Density of Total Healthcare Providers</td>
<td>0.59</td>
<td>--</td>
<td>--</td>
<td>2.52 *</td>
<td>--</td>
</tr>
<tr>
<td>Age</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0.55 **</td>
<td>N/A</td>
</tr>
<tr>
<td>Sex</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Race</td>
<td>-18.73 **</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Marital Status</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Education Attainment</td>
<td>90.19 **</td>
<td>55.27</td>
<td>68.71</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Veteran Status</td>
<td>N/A</td>
<td>N/A</td>
<td>-62.28</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Foreign-born Status</td>
<td>-295.91 **</td>
<td>-198.23</td>
<td>-279.87 **</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Employment Status</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Health Insurance Coverage</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Poverty Status</td>
<td>55.02 *</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Household Income</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Vehicle Accessibility</td>
<td>90.49 *</td>
<td>112.97 **</td>
<td>129.89 **</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Internet Accessibility</td>
<td>-58.08 **</td>
<td>-53.54 **</td>
<td>-57.03 **</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Value of Home</td>
<td>0.00 *</td>
<td>0.00 *</td>
<td>0.00 *</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Nagelkerke pseudo R² statistic: 0.1595 0.0760 0.1401

Note: All statistics reported in this table are the coefficient of parameter estimates; Crude Analysis reports the results from univariate linear regression between each group of density of healthcare providers and suicide rates. Model #1 reports the multivariable results that used the density of primary healthcare providers as the primary independent variable, Model #2 reports the multivariable results that used the density of mental healthcare providers as the primary independent variable, and Model #3 reports the multivariable results that used the density of total healthcare providers as the primary independent variable; *P ≤ 0.05, **P ≤ 0.01.
5.4 Discussion

This study examined the association between the density of healthcare providers and suicide rates in Montana counties. Several implications and strengths and limitations are discussed.

5.4.1 Study Implications

The density of primary healthcare providers yielded a positive relationship with suicide after controlling for other factors, which contrasted the investigators’ hypothesis. Moreover, the density of mental healthcare providers was non-significant and failed to show a relationship with suicide. Many studies use Health Professional Shortage Area (HPSA) designation status as a dichotomous indicator of healthcare provider density. HPSAs are used to inform funding and resource allocation based on census tracts, townships, or counties across the US and can be designated based on geographic, population, and/or facility-based shortages for either primary, dental or mental healthcare providers (Bureau of Health Workforce Resources and Services Administration, 2021). HPSAs are a helpful tool to identify regions of the US in need of healthcare providers, but they do little to inform the variability between HPSA designated regions. In context, all of Montana’s 56 counties are either partially or completely HPSA designated (Rural Health Information Hub, 2022).

The relationship between healthcare provider density and suicide has been examined at the national level. A national, county-level assessment of mental health-based HPSAs and suicide found counties that have shortages of mental healthcare providers have a 6% increased incidence of suicide (Ku et al., 2021). The current study also found a significant relationship between race/ethnicity and suicide when controlling for the
effects of the density of primary healthcare providers. Non-Hispanic White and American Indian/Alaska Native persons are two groups that comprise a large percentage of Montana’s population and historically report the highest rates of suicide among all known demographic groups (Kegler et al., 2017; Ramchand et al., 2021).

Many of the most significant risk factors for suicide disproportionately affect persons in rural areas, which was a primary reason this study was conducted in a rural US state (Monteith et al., 2021). In addition, the multi-faceted concept of rurality should be acknowledged when interpreting its impact on health disparities. In that, the rural US is not a monolith and instead comprises important geographic and cultural differences that are presented regionally (Leider et al., 2020). Accounting for differences across a myriad of rural populations may be useful when there is limited variability in rural-urban representation. One example is access to lethal means. Persons who are at-risk for suicide are at higher risk if a firearm is readily accessible (Dahlberg et al., 2004). As a result, one of the most effective measures of suicide prevention involves the restriction or prevention of access to a firearm and must be integral in addressing suicide in rural populations where rates of firearm ownership are highest (Bryan et al., 2011; Kposowa, 2013). Firearm laws vary by state and should be considered for future research that explores suicide risk across diverse rural populations.

5.4.2 Study Strengths and Limitations

The results from our study may have been influenced by a small sample size (n=56) and limited variability in the density of healthcare providers across Montana counties. Results were also limited due to small cell sizes (<5) for county-specific suicide cases, a frequent data-related challenge that links to rare health outcomes.
Considering the documented relationship between healthcare provider density and suicide at the national level, the corresponding non-significant relationships marked in our study suggest under-powered parameters. Future studies that utilize a continuous measure of healthcare provider density would increase statistical precision by combining multiple states and/or regions of the US.

It is appropriate to note that suicide is caused by many factors which were not explored in this study (Harmer et al., 2021). Substance use, for example, associates with increased risk of suicidal behavior and is most prevalent among the mentioned demographic groups with elevated suicide rates (James et al., 2017; Simoneau et al., 2017). Substance use is a growing public health concern, and such disparities might reflect the influence of the opioid overdose epidemic (Chesney et al., 2014). Social isolation is also one of the main risk factors associated with suicide and suicidal outcomes (Calati et al., 2019). Suicide prevention efforts might be most effective when multiple strategies operating across the range of contexts in which persons live and work are combined (Stone et al., 2017).

Inclusion of these suspected lurking variables in the current study may have added strength to our models’ predictive power on suicide.

Studies that are limited to specific rural regions may yield biased results due to a lack of rural-urban variability. The current study is an example of this as no Montana county is classified as either a Large central metro, a Large fringe metro, or a Medium metro, the three most urban levels of the urban-rural classification scheme for US counties (Ingram & Franco, 2013; Health Resources & Services Administration, 2021).

Several other limitations based on the study’s design must be acknowledged. First, this ecological study used county as the experimental unit. Thus, variation within counties
was not accounted for. Using county is also limiting in terms of exposure assessment. In that, a person may utilize a healthcare provider who practices outside of their residential county. There are many regions of Montana, for instance, where there are a single-digit number of healthcare providers that treat large geographic areas. Therefore, one’s proximity to a healthcare provider may not be directly associated with the county by which they reside. Furthermore, ecological studies must acknowledge the ecological fallacy that prevents generating conclusions about individuals that are based on population data. This limitation may have also contributed to potential attention of the study’s results.

Data ascertainment also elicits limitations. The three data sources used for this study are from different, yet overlapping, time periods. The density of healthcare provider data were collected in 2021. Pairing to aggregate suicide data over a 16-year period invoked the assumption that the density of healthcare providers remained consistent over such time. Pairing 5-year population estimates from the American Community Survey employed the same assumption for distributions of age, sex, race/ethnicity, etc. Lastly, it must be noted that national mortality data may misclassify suicide deaths. This is a challenge for any suicide-specific health services research as the true incidence of suicide is likely higher than currently observed. A more accurate estimation of suicide for the current study may have yielded stronger statistical precision.
Chapter 6: Conclusion

This dissertation investigated access to healthcare and its impact on persons who reside in rural areas and on persons who experience mental health challenges. Healthcare is a necessity for all humans. Thus, access to healthcare is inherently tied to one’s livelihood. Development of the original research studies discussed in Chapters 3-5 required acknowledgement of each of these considerations and a comprehensive understanding of Levesque’s multi-dimensional framework of access to healthcare, by which five dimensions are characterized: approachability, acceptability, availability, affordability and appropriateness (Levesque et al., 2013). Approachability relates to the idea that people facing health needs can identify that some form of services exist and have an impact on their health. Acceptability denotes the social and cultural factors that determine a patient’s likelihood of accepting aspects of the services they are to receive. Availability represents the idea that healthcare services may be reached both physically and in a timely manner. Affordability refers to one’s economic capacity to pay for healthcare services without compromising basic necessities. Appropriateness marks the fit between healthcare services and a patient’s specific healthcare needs (Levesque et al., 2013).

The three original research studies in this dissertation each examined multiple dimensions of access within three unique study designs. It quickly became clear that these five dimensions are not all ideally suited for the same process of examination. For instance, a cross-sectional study (Chapter 3) was appropriate to investigate barriers to healthcare access as they relate to approachability, availability and affordability because data exist from national surveys that inquire on these dimensions. Key findings that were drawn from this first study are statements that estimate prevalence. In contrast, a qualitative study (Chapter 4) was appropriate to investigate barriers to healthcare access as they relate to acceptability and appropriateness because these dimensions are not captured from national surveys and are more difficult to quantify. Key findings that were drawn from this second study are observational statements that describe characteristics of a population. Lastly, an ecological study design (Chapter 5) was appropriate to investigate measured at a population-level that are known to have influence on access to healthcare. Key findings that were drawn from this third study acknowledged the bird’s eye view of a study that indirectly explored access to healthcare and instead marks population characteristics that may have influence on the study’s research question.

The systematic acquisition of new knowledge means little without the ability to articulate a study’s implications. Because these three studies were conducted independently, linking all key findings together would be inappropriate. However, these key findings do a sufficient job at informing next steps in future health systems research efforts, namely in the need for simultaneous exploration of all five dimensions of healthcare access. There would be value in understanding the interaction effects between the quantifiable barriers to healthcare access (approachability, availability, affordability) and those often explored more qualitatively (acceptability, appropriateness). There would be additional value in considering system-level characteristics so these characteristics may be explored between system-specific populations of interest. Do social and cultural factors influence one’s likelihood of having a usual source of care? Does affordability inform a patient’s
perspective for which health services they believe are appropriate for them? Does a patient’s lack of physical availability of healthcare services cause health to be conceptualized differently? These are just a few research questions that may be explored if all five dimensions were evaluated in tandem. Performing such evaluations would require comprehensive mixed-methods approaches that pair quantitative and qualitative data with individual- and system-level information. Those who administer community health needs assessments and those who conduct independent research in the same community would benefit from pooling resources.

Across the US, the most prevalent barriers to healthcare access link to issues with affordability and barriers to healthcare access are higher among persons with mental health challenges. Inside rural health systems in Montana, healthcare consumers compose a hard-to-reach patient population, too few providers exist to meet population health needs, and fragmented communication impairs Montana’s health systems. These issues exacerbate the difficulty of ensuring acceptable and appropriate delivery of healthcare services in Montana and are compounded by other barriers to healthcare access rural residents experience. The findings from this dissertation suggest one overarching implication: individually experienced disparities in access to healthcare compound with disparities in access at the system-level, just as they do within the context of rural health and mental health. To effectively address disparities in access to healthcare in the US, the individual and the system must both be carefully considered.
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