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Journal of Rehabilitation Special Issue: A Multi-Method Garnered Perspective on Factors for Promoting Rehabilitation Equity among Multiply Marginalized People of Color with Disabilities

Guest Editor
Corey L. Moore

Guest Co-Editor
Edward O. Manyibe

Welcome to this special issue of the *Journal of Rehabilitation*. This issue represents a jacket of articles containing new findings derived from an emerging research capacity building strategy (i.e., Peer Multiple Mentor Model [P3M]) evaluation and solutions-focused translational rehabilitation research generated through the implementation of this mentorship model at the Langston University Rehabilitation Research and Training Center (LU-RRTC) on Research and Capacity Building for Minority Entities. Langston University is a historically Black college/university (HBCU). This evaluation was accomplished under the LU-RRTC research project titled “Peer Multiple Mentor Model Evaluation” (NIDILRR grant No. 90RTST0001). The publication embodies a key research capacity building outcome of advanced research training, peer-mentoring, networks, and relationships between Advanced Rehabilitation Research Training (ARRT) Program post-doctoral research fellows and mid-level and senior-level disability/rehabilitation researchers designed to diversify the scientific workforce and address ongoing systemic race-based rehabilitation disparities.

The nation’s need to alleviate these inequities has been shaped by three distinct forces. First, data confirm stable trending of national rehabilitation inequalities among multiply marginalized people of color with disabilities (i.e., African Americans, Latinx, Native Americans and Alaskan Natives, and Asian and Pacific Islanders), whereas these patterns have been further illuminated by the Coronavirus 2019 (COVID-19) pandemic’s disproportionate incidence among these target population members (Moore et al., 2020). Second, the public murder of George Floyd on May 25, 2020, triggered a nationwide social justice movement not seen since the civil rights protests of the 1960s, and escalated the calls for racial diversity, equity and inclusion (DEI) across society, including within the rehabilitation arena (Matthews et al., 2021). Third, public policy (e.g., Section 21 of the 1998 Rehabilitation Act Amendments [Public Law 93-112], the Minority Health and Health Disparities Research and Education Act of 2000 [Public Law 106-525]), and President Joseph R. Biden’s Executive Order 13985 on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government mandates federal agencies to strengthen historically Black colleges/universities’ (HBCUs), Hispanic serving institutions’ (HSIs), Tribal colleges/universities’ (TCUs) and other minority-serving institutions’ capacity to address such inequities through applied research and development (hereafter referred to as R&D) activities (The White House, 2021). These institutions are inherently linked to the re-

spective communities of color in which they serve. Although these directives have achieved marginal progress in advancing the science on improving rehabilitation experiences and outcomes, multiply marginalized persons of color with disabilities continue to experience disparities.

Given minority-serving institutions’ concentration of cultural and intellectual capital among their faculty scholars and researchers, including those with disabilities, they are ideally situated to invest these unique assets toward translational research to help alleviate such race-based inequities (Moore et al., 2021). Despite this stellar positioning, their consistent R&D under-participation, especially those that have historically been underrepresented in the federal research arena, restricts the availability of high-quality rigorous disparity research (e.g., quantitative, qualitative, and mixed methods) and serves as a plausible contributor to the national disparate rehabilitation service predicament. This knowledge scarcity as well as the current poor supply of well-trained equity investigators of color available to help increase the production and accessibility to such scientific findings compromise the active translation of new concepts, service interventions, policies, and technological innovations into the hands of key stakeholders (e.g., policy makers and strategists, rehabilitation professionals, people of color with disabilities and their family members, researchers) who can use them to benefit members of these under-served and marginalized target populations.

In an effort to address these limitations (i.e., knowledge scarcity and homogenous scientific workforce), the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) and other federal research agencies (e.g., National Institutes of Health [NIH]) are making up-to-date dollar investments in national priorities examining strategies that could help increase the number of well-trained equity researchers needed to increase scientific productivity (i.e., research publications). While some NIDILRR-funded models (e.g., Peer-to-Peer Mentor Research Team Model) have been longitudinally assessed to determine their research skill enhancement benefits among faculty members at minority-serving institutions, few efforts are afoot to assess formal post-doctoral research training pipeline infrastructure such as P3M at HBCUs that could potentially expand a currently constrained knowledge base. Although prior mentorship model development and scaled-up assessments at minority-serving institutions initially targeted current faculty members, the paradigm has since shifted to a more holistic research training agenda involving individuals

who completed their doctorates before beginning faculty positions within the professoriate. The P3M trains and mentors these post-doctoral research fellows in order to address the field's supply-side need for well-trained equity researchers and contributes to meeting the immediate need for more high-quality research aimed at alleviating rehabilitation inequalities. In addition to developing an independent research project and research grant proposal, these fellows are also integrated into an ongoing research project within the LU-RRTC. This initiative represents a collaboration between the LU-RRTC, Institute for Community Inclusion at the University of Massachusetts Boston (ICI), South Carolina State University (HBCU), North Carolina Agricultural and Technical State University (HBCU), Jackson State University (HBCU), and the Kessler Foundation.

Altogether, the first generation of NIDILRR-sponsored research capacity and skill-building prototypes at minority-serving institutions resulted in the 2017 special issue publication in the *Journal of Applied Rehabilitation Counseling* titled "Vocational Rehabilitation Experiences of Vulnerable Racial and Ethnic Populations: A Multi-Site Minority-Serving Institution Peer-Mentor Research Team Approach". This publication, led in its development by Guest Editor Corey L. Moore, highlighted articles that grew out of the aforementioned Peer-to-Peer Mentor Research Team Model evaluation. Five years later, this special issue enlarges the agenda by assessing a different approach in the P3M and highlighting a distinct set of articles that resulted from the implementation of this strategy. For this reason alone, the value of this scholarship is important; however, the national recent social unrest and movement toward addressing systemic issues negatively impacting multiply marginalized persons of color with disabilities across a range of systems, including rehabilitation, supports the need and timeliness of this issue. The purpose of the issue is to present the model's evaluation as the engine that drove the development of the subsequently presented articles that help to promote rehabilitation equity and thus extensively address Section 21.

The collection of articles in this special issue was developed through a grant to Langston University (an HBCU) from NIDILRR, a center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). Corey L. Moore, Edward O. Manyibe, and Andre L. Washington begin the special issue with an assessment of the P3M, which was implemented in a NIDILRR-funded research center housed on an HBCU campus. This study represents an analysis of five Advanced Rehabilitation Research Training (ARRT) Post-Doctoral Research Fellows' and eleven mentors' in-depth perspectives on the model's research skill-building (i.e., methods and grant writing) benefits and challenges. In the second article, Courtney Ward-Sutton and the research team used secondary data from the 2015 Kessler Foundation National Employment and Disability Survey (KFNEDS) to examine the relationships between race, assistive technology (AT) workplace accommodations and employment status. The authors present strategies for examining potential inequities in the need for or the receipt of actual AT workforce accommodations. Next, Ben R. Koissaba and research team members deliver a scoping review of the literature on opioid use disorder impacts on community living outcomes among people of color with disabilities. They identify select community factors that might be considered

for advancing the independence of multiply marginalized persons of color with disabilities. In the fourth article, they subsequently present a companion study to the previous article that examined the perceptions of 12 vocational rehabilitation, substance abuse, and mental health service providers (e.g., counselors, clinicians, directors) about barriers and solutions to improving community living outcomes among target group members. Solutions are recommended for addressing community living outcome disparities. Next, Edward O. Manyibe and others provide a scoping review of the literature on COVID-19 and health and rehabilitation implications for multiply marginalized persons of color with disabilities and mapped research gaps. The authors discuss how the disproportionate incidence of the virus among these individuals, complicated by social determinants of health, has resulted in the need for culturally competent services and research to address individual and systems level equity issues that impede positive employment, community participation, and health and function outcomes and experiences.

Sharesa H. McCray and others present article number six and seven where the former represents a scoping review of the literature while the latter presents results from a focus group discussion involving 12 vocational rehabilitation, substance abuse, and mental health service providers to identify key factors that impact usage and accessibility of opioid user disorder treatment via telehealth among rural African American with disabilities residing in rural communities. They identify treatment benefits and advantages as well as critical service challenges across each of these articles, respectively. The next article is led by Jean Johnson where she and co-authors propose two different emerging co-service models for improving employment outcomes among veterans of color. They discuss how these models could be adopted by state vocational rehabilitation agencies (SVRAs) and American Indian vocational rehabilitation programs (AIVRPs) collaborating with the United States Department of Veterans Affairs Vocational and Rehabilitation and Employment programs (VA VR&E) through the diffusion of innovations theory. Finally, Corey L. Moore and his team of researchers use national fiscal year 2019 Rehabilitation Services Administration (RSA)-911 data to examine vocational rehabilitation agency serving patterns during the COVID-19 pandemic. Strategies for improving employment outcomes within SVRAs are discussed. These articles provide various service, policy, and future research recommendations that the readership can consider for improving rehabilitation (i.e., employment, community participation, and health and function) experiences and outcomes among multiply marginalized persons of color with disabilities.

As an ending but important note, discourse on the "colonization" of health-related equity research and incursion of White researchers with little or no track records of research on the topic pursuing grants through new massive federal agency R&D investments has been trending in editorial power circles (McFarling, 2021). African American and other researchers of color, including those with disabilities, who helped develop the very foundation for equity research are being pushed to the periphery by these "health equity tourist" who not only have greater access to resources and networks and possess research reputations, but also dominate peer review and journal editorial board systems – which are often criticized for devaluing equity research topics in the past (Jordan et al.,

2021). This power differential rest upon long-standing systemic and structural race-based biases in journal editorial and federal research agency systems that foster the appropriation of the work accomplished by researchers of color in the equity space and thus diminishes cultural competence across the research paradigm, which leads to harmful research findings (McFarling, 2021). Recognizing this phenomenon, academic professional trade journals have issued apologies for the under-representation of researchers of color as lead authors in special issues covering the topic of health-related equity. This special issue is significant as it represents a disruption in this pattern as all the lead authors are researchers of color (i.e., African American/Black), and two of these individuals, who lead four or almost half of the articles are also investigators with disabilities. We want to thank Dr. Wendy Parent-Johnson and the Journal of Rehabilitation for supporting the development of this publication and providing an avenue to disseminate this timely and important work.

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NOTE

1. National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) Grant No. 90ARST0001, 90AR5029, and 90RTST0001; for further information, please see our website at www.langston.edu/capacitybuilding-RRTC.

Peer Multiple Mentor Model (P3M) for Training Disability/Health and Rehabilitation Equity Researchers: Case Study at a Historically Black College/University

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Post-doctoral mentorship and training is considered a critical research capacity building approach vital to successful research career development. Existing models, however, may be insufficient for improving research skills among fellows at minority-serving institutions. This study evaluated a Peer Multiple Mentor Model (P3M) at a historically Black college and/or University (HBCU) designed to provide advanced research training to post-doctoral fellows and alleviate long-standing employment, health and function, and community participation inequities among multiply marginalized people of color with disabilities. The results showed that fellows experienced improved research skills, scientific productivity, and collaboration/networking opportunities. The model represents a promising research training pipeline component.

Keywords: *Minority-Serving Institutions, Disability/Health and Rehabilitation Research Mentorship, Equity Research and Evaluation*

Policymakers and strategists, researchers, educators and other higher education stakeholders increasingly recognize the critical role that minority-serving institutions (MSIs) in the United States (U.S.) can play in both diversifying the scientific workforce (Espinosa et al., 2019; Gasman & Conrad, 2013; Moore et al., 2021) and alleviating disability/health and rehabilitation inequities experienced by multiply marginalized persons of color with disabilities (Moore et al., 2012; Moore, Manyibe, Aref, et al., 2017; Moore, Manyibe, Sanders, et al. 2017; Moore et al., 2021). MSIs are defined as historically Black colleges and/or universities (HBCU); Hispanic-serving institutions (HSIs) with 25 percent or

more total undergraduate Latinx full-time equivalent student enrollment; American Indian Tribal colleges or universities (TCUs); and institutions of higher education whose minority student enrollment is at least 50 percent (U.S. Department of Education, 2013). These institutions constitute a crucial component of the country's post-secondary educational ecosystem. Although they provide all students, regardless of race, an opportunity to develop their skills and talents, MSIs channel the lived experiences of people of color (Espinosa et al., 2019; Gasman & Conrad, 2013; Moore et al., 2016).

Regrettably, scholars based at these institutions are underrepresented as principal investigators in federally sponsored research and development (R&D) as well as in scientific publications (Cunningham et al., 2014; Matthews, 2012; Moore et al., 2021). Specifically, the pool of well-trained MSI-based researchers available to conduct high-quality, rigorous disability/health and rehabilita-

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tion research aimed at improving outcomes and promoting equity is severely limited (Aref et al., 2017; Manyibe, Moore, Aref, et al., 2017; Manyibe, Moore, Wang, et al., 2017; Moore et al., 2015). This is especially true for those at MSIs (e.g., HBCUs) that have been historically underrepresented as grantees in the federal research arena. Moore and his colleagues (2012), in a seminal study funded by a Delta Sigma Theta Sorority, Inc. Distinguished Professor Endowed Chair (DPEC) award, documented this discrepancy across the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) investment portfolio; none of the 229 observed “grantees” across seven funding mechanisms in fiscal year (FY) 2010 were HBCUs. Although total science and engineering (S&E) support to HBCUs has increased across the federal agency landscape, support in the form of R&D obligations has declined. In FY 2019, total R&D support to all HBCUs was \$233 million, a 6% decrease from the \$247 million obligated in FY 2018 (Pece, 2021). In 2011, an NIH-commissioned study (i.e., Ginther et al., 2011) found that African American applicants were 10 percentage points less likely to receive an R01 award compared to White applicants after controlling for race, education and training, employer characteristics, NIH experience, and research productivity. Hoppe et al. (2019) linked this discrepancy to a need for new policy and priorities to help broaden African American researchers’ capacity to conceptualize fundable topic choices and proposals, and their increased representation on grant review sections and panels. In 2014, each of the four top predominantly White institutions (PWIs) received more revenue from federal grants and contracts than all four-year HBCUs combined (Toldson, 2016).

The marginalization of these institutions and their affiliated researchers, including those with disabilities, from optimal participation in federally sponsored R&D has been increasingly linked to a cascade of inequitable employment, health and function, and community participation experiences and outcomes among multiply marginalized persons of color with disabilities (Moore et al., 2021). To address these inequities, some federal agencies, policymakers, and equity researchers have prioritized post-doctoral training as one innovative approach for improving the research capacity of MSIs that have been historically underrepresented in the federally sponsored disability/health and rehabilitation R&D enterprise. Between 60,000 to 100,000 post-doctoral researchers work in various research fields in the U.S. (McConnell et al., 2018; National Academies of Sciences [NAS], 2014). While they have increased by 150% between 2000 and 2012 (NAS, 2014), the number of those of color has remained significantly low. As shown in table 1, among all U.S. citizen and permanent resident postdoctoral scholars in 2010, only 3.0% were African American and 3.9% were Latinx (Einaudi et al., 2013). In 2015, about 9% of those who received a Ph.D. were individuals of color, yet only 5% of post-doctoral researchers in those fields were from those same groups (NAS, 2018.).

Although the number of post-doctoral training programs have grown tremendously over the decades, the overwhelming majority are concentrated at PWIs, especially research-intensive universities (Ferguson et al., 2021; McConnell, et al., 2018). Consequently, little is known about the types of mentoring models that are most effective for developing post-doctoral trainees into well-trained

researchers at HBCUs and other MSIs. There is also limited empirical data available on how these models should be designed at these institutions to achieve optimal research skill development and learning outcomes. More specifically, to our knowledge there is no existing study that has evaluated the benefits of peer multiple mentor-based approaches in enhancing fellows’ research methods and grant-writing skills within MSI context. Moreover, many of the existing studies focus on mentoring programs implemented at PWIs. The purpose of the current study was to assess the P3M, a model designed for and implemented at an HBCU to provide advanced research mentoring and training for post-doctoral fellows who aim to conduct independent disability/health and rehabilitation research.

Theoretical Underpinnings

The theories of critical mass and social network were used to inform the design of P3M. These mutually inclusive theoretical approaches are particularly suitable in contextualizing mentoring activities at MSIs, which experience inadequate advanced research training opportunities. The critical mass theory (Carrigan et al., 2011; Collins et al., 2010; Torchia et al., 2011) was used to illuminate the need for MSIs and their affiliated researchers, including those with disabilities, to assume more than tokenistic R&D participation across the federal disability/health and rehabilitation research enterprise. ‘Critical mass’ theory was developed to understand ‘critical mass’ dynamics (Centola, 2013). It can be defined as the level of activity above which a behavior becomes self-sustaining (Centola, p. 239). From a minority community perspective, this theory posits that a minority group will influence change and group interactions when it reaches critical mass (Excelencia in Education, 2017). We contend that a critical mass of post-doctoral fellows at these institutions would make significant contributions not only toward alleviating disparities but also in recruiting, mentoring, and socializing early-career investigators and students of color, including those with disabilities, into the research enterprise

Table 1

Institutional (2010 Carnegie) Classification and Sex, Citizenship, Ethnicity, and Race of Postdocs in Science, Engineering, and Health: 1979–2010

Characteristic	1979	1980	1990	2000	2006	2007 new	2008	2009	2010
All postdocs	18,101	18,399	29,565	43,115	49,343	50,840	54,164	57,805	63,415
U.S. citizens and permanent residents ^c	12,036	11,893	15,115	19,452	21,147	22,103	24,915	27,105	29,769
Temporary visa holders	6,065	6,506	14,450	23,663	28,196	28,737	29,249	30,700	33,646
Hispanic or Latino	na	na	na	na	na	na	na	na	1,160
Not Hispanic or Latino									
American Indian or Alaska Native	na	na	na	na	na	na	na	na	93
Asian	na	na	na	na	na	na	na	na	5,174
Black or African American	na	na	na	na	na	na	na	na	898
Native Hawaiian or Other Pacific Islander	na	na	na	na	na	na	na	na	92
White	na	na	na	na	na	na	na	na	15,689
More than one race	na	na	na	na	na	na	na	na	140
Unknown ethnicity or race	na	na	na	na	na	na	na	Na	6,523

Note. Adapted from <https://www.nsf.gov/statistics/infbrief/nsf13334/nsf13334.pdf>

(Moore et al., 2016). In her seminal work on the subject, Kanter described the importance of reaching a critical mass noting that “numbers, especially relative numbers, can strongly affect a person’s fate in an organization. This is a system rather than an individual construct—located not in the characteristics of the person, but in how many people, like that person in significant ways, are also present” (Kanter, 1977, p. 241).

The social network theory, on the other hand, focuses on the role of social relationships in transmitting information, channeling personal influence, and enabling attitudinal or behavioral change (Valente & Pitts, 2017). A network consists of nodes/actors and edges. Within the context of scientific research, the nodes usually represent individual researchers, or a group of researchers and the edges represent the relationships between them. Scientific networks, like many social networks, generally develop because of the informational advantage they offer participants. Plausibly, this theory is often used to understand social capital (Sánchez-Arrieta et al., 2021), the advantage that an individual, team, group, or a network may gain from social interactions because of their location in social networks (e.g., who they are connected with). Interestingly, social capital can be converted to economic or human capital because of its benefits to a social network. In general, highly connected researchers, for example, tend to have access to more diverse scientific information (e.g., databases, funding sources and requirements) and more influential (e.g., shaping policies and funding priorities) (Hanneman & Riddle, 2005). Conversely, less connected people (e.g., MSI-based scholars) tend to be marginalized in many areas of the scientific paradigm. Within the context of federally funded research, this means that those who are part of established scientific networks will have greater access to important information, training opportunities, and resources. Another important aspect is that any changes that occur in networks that are held together by a single node/researcher individuals can potentially have a profound effect on the network (Sánchez-Arrieta et al., 2021). For example, the removal of a single researcher of color from an HBCU network, which is usually held together by a single seasoned scientist, can lead to the disintegration of the network. Similarly, an addition of a seasoned researcher to the HBCU network can potentially have several positive effects on the network. This partly explains the critical importance of increasing the number of research leaders at minority-serving institutions.

The Peer Multiple Mentor Model (P3M), as shown in Figure 2, was officially launched and implemented on November 15, 2017 through April 6, 2021 at Langston University, an HBCU located in Oklahoma. This initiative was carried out over this nearly four-year period in collaboration with the Institute for Community Inclusion (ICI) at the University of Massachusetts Boston (Asian American and Native American Pacific Islander-serving institution [AANAPISI]), North Carolina Agricultural and Technical State University (HBCU), South Carolina State University (HBCU), Jackson State University (HBCU), and the Kessler Foundation to facilitate advanced research training and mentorship for MSI-based post-doctoral research fellows. The P3M was federally funded through NIDILRR’s Advanced Rehabilitation Research Training (ARRT) Program- Minority Serving Institutions (grant #90AR5029 and grant #ARST0001); and was assessed by the Rehabilitation Research and Training Center on Research and Capacity Building for Minority Entities at Langston University (LU-RRTC; grant #90RTST0001).

The model represents a new theoretical paradigm, and contrasts remarkably with traditional mentoring approaches (e.g., ARRT) carried out by various federally-funded projects in the following ways: (a) the traditional model generally requires fellows to have one mentor, whereas the P3M considers multiple mentors as essential to meeting constantly evolving multiple needs; (b) the traditional approach emphasizes individual research practicum whilst the P3M focuses on team science/collaborative research and science teams; (c) the old model embodies a relationship where the mentor functions as the senior researcher to the fellow, whereas the P3M deemphasizes this seniority and hierarchy structure and stresses a peer-based relationship; (d) the traditional approach provides fellows with didactic statistics and methodological seminars and workshops, whilst the P3M not only provides such opportunities but also stresses community of practice participation; and (e) unlike many traditional models, the P3M focuses on developing fellows’ cultural competences that acknowledge the importance of the social determinants of health in shaping and driving employment, health and function, and community participation outcomes among multiply marginalized persons of color with disabilities.

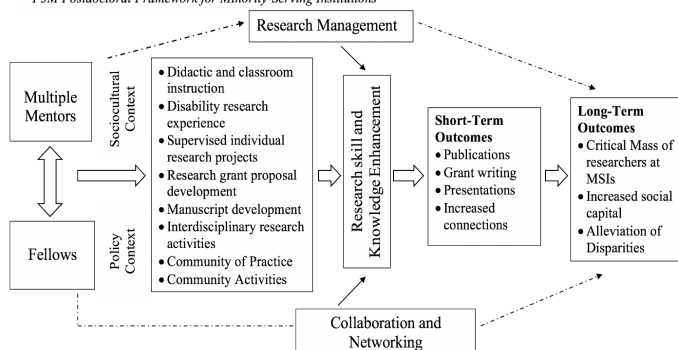
Study Setting

The advanced rehabilitation research post-doctoral training initiative was housed in the LU-RRTC, within the Department of Rehabilitation and Disability Studies (DRDS). The RRTC serves as the national “flag ship” research center for empowering MSIs to participate in R&D addressing race/ethnic-based inequities across employment, community participation and health and function outcome domains. The center functions in an interdisciplinary environment and provides training and mentoring in rigorous scientific methods, and has a multidisciplinary staff of 9 core investigators who examine contemporary complex scientific and societal issues relevant to Section 21 (b)(2)(A) of the Rehabilitation Act of 1973, as amended. The comprehensiveness of its current agenda (i.e., 10 different service and policy research programs) offers fellows the opportunity to be integrated in ongoing projects as active research team members. In addition, through its research and technical assistance agenda, the center has developed an extensive network of collaborators that include other HBCUs and MSIs, national research centers and institutes, state vocational rehabilitation agen-

The Peer Multiple Mentor Model

Figure 1

P3M Postdoctoral Framework for Minority-Serving Institutions



cies (SVRAs), Veteran Affairs (VA), and consumer organizations. These networks offered additional opportunities to establish collaborations and expand their networks.

Structure of the Model

As shown in figure 1, P3M consists of six main components that include pairing multiple mentors with post-doctoral trainees, mentoring activities, research management, collaboration and networking experiences, research skills and knowledge enhancement, and short-term and long-term outcomes. These mutually inclusive components are hypothesized to enhance the fellows’ research skills and overall mentoring experience. Mentoring is conceived as generally involving the eight following main activities; didactic classroom instruction, community of practice, disability research experience, supervised individual research projects, research grant proposal development, manuscript development, interdisciplinary research activities, and community activities. The model is systematic but not rigid or linear. Rather, it considers mentoring as an iterative and fluid process whose components constantly overlap resulting in both intended and unintended outcomes. For example, it is possible for fellows and mentors to produce manuscripts and secure grants at the early stages of the model even though these items are presented as outcomes or the end products. The dotted lines indicate constant interaction between internal institutional research ecosystem and external forces such as policies, funding agency priorities, and sociocultural and political influences that drive the research enterprise and therefore act as strong determinants of the model’s success. Consistently, P3M embraces a holistic approach, building on the interrelatedness of its intervention components in order to achieve optimal outcomes (Moore et al., 2021). Short-term outcomes are conceived as authorships and co-authorships on refereed (i.e., trade journals) and non-refereed publications (e.g., technical/policy research briefs, monographs), submitted and/or funded research grant proposals, presentation of research findings to target audiences, etc. Long-term outcomes are conceived as critical mass of researchers at HBCUs and other MSIs, increased social capital, and alleviation of disparities in NIDILRR’s three domains: employment, health and function, and community living and participation. The model components represent critical mass and social network elements, which are consistent with efforts to diversify the scientific workforce and improve MSI research infrastructure.

Application of the Model

General Orientation

The fellows spent the initial two weeks of the fellowship participating in an in-depth orientation to the LU-RRTC and LU. During this period, LU-RRTC based scientific mentorship panel members met with them to develop rapport, discuss their research interests, and provide an overview of active projects that they would select to integrate onto as an interdisciplinary research team member. Other topics covered were an introduction to LU-RRTC and the DRDS; a review of RRTC and departmental procedures and policies; explanation of benefits and paid time off; overview of studies and current capacity building initiatives; synopsis of the fellowship and expectations, deadlines and institutional review board (IRB) submission procedures; a summary of community-based practicum assignments and didactic schedule; and a review of the Family Educational Rights and Privacy Act and impli-

cations for research in secondary high school settings. In addition, they completed Health Insurance Portability and Accountability Act (HIPAA) and Human Research Subjects Protection training certifications through Collaborative Institutional Training Initiative (CITI) or Protecting Human Research Participants (PHRP) on-line modules. The LU-RRTC principal investigator as a primary mentor and other investigators as secondary mentors were assigned to each fellow.

Multiple Mentors and Fellows

A core component of P3M is mentored research involving multiple mentors working together with fellows to achieve desired results. A scientific panel of eleven mentors from the LU-RRTC, ICI, North Carolina Agricultural and Technical State University, South Carolina State University, Jackson State University, the Kessler Foundation, and SUNY Downstate Medical Center was developed to ensure fellows received adequate guidance. The panel included current and former NIDILRR-funded RRTC principal investigators/directors, statisticians, methodologists (quantitative and qualitative experts), and content experts committed to building the fellows’ research skills. The usefulness of multiple mentors is based on the social network theory (Hanneman & Riddle, 2005; Valente & Pitts, 2017), which espouses that mentoring networks offer several benefits when compared to traditional one-on-one mentoring senior-junior mentor dyads. Mentorship panel guidance and supervision was on-going. Multiple mentors were also used to ensure a more inclusive research community and create well integrated equity researchers.

Model Intervention Components

The model also conceptualizes *didactic and classroom instruction* as a critical component of post-doctoral training. As summarized in table 2, fellows spent a minimum of 6 hours per week in required research coursework during their first year. In Year II, coursework decreased to 3 hours per week. Coursework and classroom instruction were designed to increase the fellows’ knowledge

Table 2
Core Mentorship Training Activities for Fellows in Years I and II.

	Year 1	Fellow's Activities	Year 2	Fellow's Activities
Mentoring	15 hrs/wk	<ul style="list-style-type: none"> Identify primary mentor Work with mentorship panel Design independent research project with mentorship panel's guidance including: <ul style="list-style-type: none"> Formulate research questions Complete relevant lit. review Obtain IRB approvals Recruit participants 	20 hrs/wk	<ul style="list-style-type: none"> Complete independent research project with panel's guidance Complete data collection(s) Analyze data Prepare abstract for submission to professional or consumer presentation Prepare findings for submission in peer-reviewed journal
Research Didactics	6hrs/wk	<ul style="list-style-type: none"> General Orientation (1* 2 wks) Complete certification in: <ul style="list-style-type: none"> Human Res. Par. Protection HIPAA Complete seminars in-Research Strategies <ul style="list-style-type: none"> Qualitative methods Diversity & disability studies PAR in Rehabilitation. Critical Review of Rehabilitation literature Manuscript & Grant Dev. Adv. Data Man. & software Participate in Mtgs Research Advisory Board Inter. Research Team Webinar participation CoP participation 	3 hrs/wk	<ul style="list-style-type: none"> Complete seminars in: <ul style="list-style-type: none"> Research Strategies Qualitative methods Diversity & disability studies PAR in Rehab. Critical Review of literature Manuscript & Grant Dev. Adv. Data Man. & software Research Advisory Board Inter. Research Team Webinar participation CoP participation
Interdisciplinary Research Activities	14 hrs/wk	<ul style="list-style-type: none"> Member of interdisciplinary research team involvement in LU-RRTC research protocols Individual supervision on collaborative research activities 	12 hrs/wk	<ul style="list-style-type: none"> Member of interdisciplinary Research team involvement in LU-RRTC Research protocols Individual supervision on collaborative research activities
Total Research	35 hrs/wk		35 hrs/wk	
Community Didactics/ Activities	5 hrs/wk	<ul style="list-style-type: none"> Attend select community employment support seminars/workshops Participate in community-based experiences and/or provide employment support interventions Participate in weekly supervision 	5 hrs/wk	<ul style="list-style-type: none"> Attend select employment support seminars/workshops Participate in community-based experiences and/or provide employment interventions Participate in weekly supervision
Total Community	5 hrs/wk		5 hrs/wk	
Total Hours	40 hrs/wk		40 hrs/wk	

of research methodologies, multicultural research best-practices, and solutions-focused approaches suitable to the field of rehabilitation. Both synchronous (e.g., Zoom meetings) and asynchronous (e.g., emails and text messages) tools of communication were utilized to facilitate didactic and classroom instruction. These communication technologies were effective in eliminating geographic barriers and facilitating scheduling flexibility. All fellows participated in *disability research experiences*. They attended yearly research advisory board meetings that the principal investigator facilitated. These scientific information exchange meetings provided them with networking and collaboration opportunities. In addition, they provided fellows with on-going “think-tank” experience that is vital for leadership development in planning, implementing and quality control of research activities. Fellows were also integrated in various ongoing and new RRTC research projects. Based on the discussions, the fellows and mentors developed goals (e.g., due date for first draft of the manuscript).

As part of the mentored post-doctoral experience, fellows participated in *supervised individual projects*. All fellows met weekly with their primary mentor and often times with at least one secondary mentor to discuss individual and team progress. They also met at least once a month with the scientific panel of mentors to discuss various aspects of their research projects. These daily, weekly and regularly scheduled, face-to-face individual supervision meetings were intended to provide individual fellows in-depth mentored services specific to their respective projects. In addition, mentors used these intensive meetings to evaluate the progress of fellows. A fundamental component of P3M was the *grant-writing and management training*. The training was designed to prepare post-doctoral fellows to write competitive and winning federal-funded research proposals and create awareness about federal research funding opportunities (e.g., NIDILRR and NIH). The topics usually covered included the fundamentals of successful grant-writing, general preparation of the grant application such as interpretation of funding opportunity announcement (FOA), specific aims, research design, budgets, analysis of reviews and strategies for rebuttal and re-application, and an overview about the various available funding mechanisms within NIDILRR and other federal research funding agencies. The mentors reviewed proposals and provided fellows with critical feedback.

A core intervention element of the P3M includes *manuscript development training*, which focuses on enhancing fellows’ skills in creating papers that could be submitted for publication consideration in peer-reviewed professional and trade journals. The model ensures fellows work collaboratively with guidance and feedback from multiple mentors to develop manuscripts (e.g., original articles, case reports, policy briefs, and special reports). It especially focused on fellows developing empirically driven findings, which represents the “gold standard” as a scientific performance measure in academia as well as an indicator of future productivity potential (Moore, Manyibe, Sanders, et al. 2017). Fellows, under the guidance of mentors participated in several *interdisciplinary research activities* as part of their training to ensure that they had experience with a diversity of rehabilitation research protocols and methodologies offered within the LU-RRTC. In Year II of training for each two-year cohort, the time spent on interdisciplinary research activities decreased to allow adequate time for fellows to

focus on completion of their independent research project under mentorship.

Another key component of the fellowship program is the *community of practice* (CoP). The CoP allowed fellows to engage in a process of collective learning (Bezyak et al., 2013). A series were developed and facilitated by one of the LU-RRTC partners based at South Carolina State University. All fellows periodically met virtually over the course of the post-doctoral experience to share information about their research interests and progress, learn new research skills and behaviors, and receive psychosocial support. The CoPs also included other pre-doctoral and post-doctoral fellows affiliated with the LU-RRTC. Fellows accepted as part of the first cohort participated in *disability community activities*. Memorandums of support for fellow placements in clinical/community settings were fully executed for Oklahoma City Public Schools- Department of Special Education, Oklahoma Department of Rehabilitation Services, Community Health Centers of Oklahoma, Inc., and Goodwill Industries of Central Oklahoma. A fellow completed her experience prior to the COVID-19 pandemic at the Community Health Centers of Oklahoma, Inc., where she worked with patients and leadership to develop a needs assessment survey, collected and analyzed the data and developed findings with recommendations for their Department of Behavioral Health. These experiences, however, were restricted for the subsequent cohort as the COVID-19 pandemic prevented placement due to LU policy and employee safety concerns, as well as similar concerns at the placement sites.

Method

This evaluation utilized a qualitative, phenomenological case study design to capture the voices and lived experiences of the participants (Griffin, 2012; Moore, Manyibe, Aref, et al., 2017; Moore, Manyibe, Sanders, et al., 2017). Case studies are useful in exploring complex and multifaceted phenomena and are frequently used in evaluation research specifically because of their ability to explain an outcome while considering the social context in which it occurs (Creswell, 2013). In case studies, the researcher often has an interest in the case and uses a variety of data sources to capture the participants’ experiences through their voices (Griffin, 2012). Evaluation is a method of determining how well a program (i.e., P3M) achieved its objectives by measuring results. In this case study, data were garnered from four different sources: online survey, telephone interviews, document review, and observations. Using a multi-method data collection approach helped us to gain a more in-depth insight into the experiences of the participants than would be obtained using only a single data source as well as allowed methodological triangulation (Creswell, 2013). The following questions guided the evaluation of the model:

1. How did fellows and mentors evaluate the peer multiple mentor model? How did they describe their experiences?
2. What model components did fellows and mentors find beneficial, and could be considered for adoption for training equity researchers in the field?

Sample

The study sample consisted of 5 post-doctoral fellows and

11 mentors. A purposive sampling was used to select participants (Palinkas et al., 2015). Using purposeful sampling enabled us to identify and recruit fellows with a broad range of lived experiences. The following inclusion criteria were used to select them: (a) satisfactory completion of all academic requirements for a doctoral degree in the rehabilitation or allied health science from an accredited university; (b) demonstrated interest in the rehabilitation of individuals with disabilities as evidenced by prior relevant professional and/or research experiences; (c) strong commitment in obtaining employment as an academic or researcher at a MSI at the end of the training, if not already employed at an HBCU, TCU, HSI, or AANAPISI; (d) long term academic goals related to pursuit of research in a related area of disability, vocational rehabilitation, and employment research; and (e) willingness to commit two years to advanced rehabilitation research training. The selection committee made the final selection of qualified candidates after reviewing the application material, including academic transcripts; letters of reference provided by the candidate from the chairman of their doctoral program, internship coordinator or research supervisors; copies of prior publications or collaborative scholarly materials; and statement of rehabilitation research interests and how they match learning objectives and research experiences provided in the program. Mentors were selected based on their research experience and commitment to the field of disability/health and rehabilitation and mentor fellows based at MSIs. Participation was voluntary, and informed consent was provided by all key informants and respondents. Human subjects approval was obtained from the IRB.

Procedures and Data Collection

Multiple methods (i.e., surveys, interviews, observations, and document reviews) were used to collect qualitative data. Consistent with qualitative approaches, data collection and analysis were an ongoing process.

Online Survey

All fellows and mentors were asked to complete an online survey at the beginning and at the end of the intervention. The questionnaires included a demographic section and a section containing open-ended questions. The pre-intervention and post-intervention surveys for fellows contained 39 and 20 items, respectively. The pre-intervention and post-intervention surveys for mentors contained 11 and 20 items, respectively. The pre-intervention surveys were administered between April 11, 2019 and April 19, 2019 and contained questions about respondents' prior mentoring experience, mentoring expectations, motivating factors to participate in mentoring, and their perspectives about the benefits of participating in P3M. Two fellows completed the pre-intervention survey retrospectively. The post-intervention surveys were conducted between January 24, 2021 and April 6, 2021 and consisted of questions related to the fellows' and mentors' experience participating in the P3M. The survey development was a collaborative process that involved identifying topic of interest, reviewing the literature, identifying relevant existing survey items, drafting survey items, and reviewing draft survey items with research team members (Draugalis, et al., 2008). This process allowed us to leverage the expertise of individuals within and outside of the research center (e.g., advisory panel members).

Interviews

Due to the COVID-19 pandemic, we conducted semi-structured telephone instead of face-to-face interviews, between October 15 and November 20, 2020 with fellows. We used a semi structured interview protocol, developed by the research team members. The protocol contained questions about the participants' perspectives regarding different aspects of PPMRTM, including their experiences, useful strategies, and challenges. Two of the research team members, who were trained interviewers, conducted the one-to-one telephone interviews. The interviews were digitally recorded and transcribed by a professional agency. Each interview took approximately 30 minutes to complete.

Document Review and Observations

Document reviews and observations were ongoing across the span of the assessment. For fellows, we reviewed application materials, feedback received from mentors, weekly meeting reports/minutes, monthly mentor-fellow panel minutes, manuscript and proposal reviewer comments. For mentors, we reviewed weekly and monthly meeting minutes, and mentors' progress reports. Observations were conducted directly (e.g., watching fellows present at a conference) or indirectly (e.g., peer reviewing manuscripts or proposals). Data gleaned from the documents and observations were used to corroborate survey and interview data. The review of documents (Maxwell & Granlund, 2011) provided rich information regarding the fellows' research values, beliefs, and confidence to do research.

Positionality

A central element in qualitative research, is the position that researchers adopt within a given study. It also represents a space in which objectivism and subjectivism intersect (Bourke, 2014). According to positionality theory, people generally have multiple overlapping identities. Moreover, in qualitative research, the researcher is also a data collection instrument (Bourke, 2014; Day, 2012; Jacobson & Mustafa, 2019). In this study, we were both researchers and part of the national scientific mentorship panel. In addition, we taught seminars/workshops in advanced research methods to the post-doctoral fellows at the HBCU where the model was implemented. These overlapping identities presented opportunities and challenges throughout the research process (Day, 2012; Moore et al., 2017b). Because of this awareness, during our research team meetings and at our individual spaces, we interrogated how our positionality might impact the research process. We maintained, throughout the research process, an informed reflexive awareness to contextualize our position in relation to the research process and participants. We discussed and addressed any biases and assumptions throughout data collection, analysis, and interpretation (Bourke, 2014; Day, 2012), thus ensuring that the credibility of the research process was maintained. Our explicit perspectives on these positions allow those who consume our work to better grasp how we produced and interpreted the data (Jacobson & Mustafa, 2019).

Data Analysis

The researchers used descriptive statistics to report the demographic information and quantitative findings of the survey. SPSS Windows, Version 22, procedures were employed to analyze quantitative data. Qualitative data garnered from surveys, interviews,

document review, and observation were subjected to thematic content analysis using an adapted version of the Qualitative Analysis Guide of Leuven (QUAGOL), which offers a comprehensive method to guide the process of qualitative data analysis (Dierckx de Casterlé et al., 2012). Two of the authors formulated the context and essence of the qualitative data separately and then discussed this together. Consistent with QUAGOL, the process of analysis consisted of two parts: (a) a thorough preparation of the coding process and (b) the actual coding process using a qualitative software program. The two parts consist of 5 stages, characterized by iterative processes of digging deeper, constantly moving between the different stages.

During the preparatory part, we read the transcripts thoroughly in order to become as familiar as possible with the survey, interview, document review, and observation data. The five steps of this phase included: (a) thorough re(reading) of the transcript to get knowledge of what the interview is about, and highlighting the relevant fragments; (b) preparing a narrative summary by describing the key story lines close to participants' words; (c) schematically describing the key ideas of the interview in a conceptual scheme; (d) fitting test and adaptation of the conceptual scheme by going back to the transcript; (e) looking for common ideas/concepts across conceptual schemes (Dierckx de Casterlé et al., 2012). This process helped us to develop a holistic understanding

of the data. During the actual coding process, we used NVivo (Version 10) software. This procedure involved drawing up concepts, coding process-back to the ground, analyzing concepts, extraction of essential structure, and description of results. The constant comparison process, which is the primary activity in QUAGOL and closely aligned with a grounded theory approach (Charmaz, 2014), involved us interrogating our interpretations with the actual participant story, as well as checking new ideas for their presence in transcripts. We used a peer-check system whereby investigators cross-checked categorizations and statement codes. Multiple discussions eventually led to 100% agreement of the final set of codes. Verbatim quotes from the participants are presented to validate coding, interpretation, and conclusions.

Results

Participant Demographic Characteristics

The study sample consisted of five post-doctoral research fellows and eleven mentors. Four of the five fellows had never participated in a formal research mentoring program prior to their participation in the model. In addition, all fellows had never submitted a grant proposal to NIDILRR or any other federal funding agency prior to participating in P3M. Two mentors completed the post-intervention survey only. A majority of the mentors were African American (57.14%, 50%) at baseline and post-intervention, respectively. In addition, a majority of the mentors had a doctorate degree (85.71% and 100%) at baseline and post-intervention, respectively. Table 3 provides detailed demographic information about characteristics of the fellows and mentors at baseline and post-intervention.

Themes and Sub-themes

The following section presents major themes and sub-themes that emerged from the qualitative data analysis. The major themes were positive mentorship experience, mentoring benefits/advantages, research productivity, perceived effective model components for building post-doctoral fellows' research skills, components that can be replicated/adopted, and implementation challenges and solutions. The key themes were derived from the questions that guided the study.

Positive Mentorship Experience

All fellows and mentors described their mentorship experiences as positive. Participants identified six key subthemes that contributed to their positive mentoring experiences; capable multiple mentors, safe and supportive environment, collegiality and mutual respect, professional relationships, and team science. These features were consistent with what mentors and fellows identified at the beginning of the post-doctoral training that they considered as useful strategies (e.g., establishing good rapport with mentees, communicating clearly expectations and goals for mentorship and role differences between mentors and mentees, scheduling regular meetings with mentees) for facilitating a successful mentorship relationship.

Capable Multiple Mentors

A unique feature of P3M is its focus on multiple mentors. All fellows were matched with multiple mentors with a variety of skill sets. The principal investigator served as the primary mentor. All

Table 3
Demographic Characteristics of Fellows and Mentors at Baseline and Post-Intervention

Variable	Baseline n (%)	Post-intervention n (%)
Fellow-Characteristics		
Gender		
Male	1(20%)	1(20%)
Female	4(80%)	4(80%)
Disability		
Yes	2(40%)	2(40%)
No	3(60%)	3(60%)
Race/Ethnicity		
Black/African American	5(100%)	5(100%)
Age (Median)	32	34
US Citizen	5(100%)	5(100%)
Mentor-Characteristics		
Gender		
Male	6(66.67%)	7(63.64%)
Female	3(33.33%)	4(36.36%)
Age (Mean)	47.51	52.5
Race/Ethnicity		
African American/Black	6(66.67%)	6(54.55%)
Caucasian/White	-----	2(18.18%)
Hispanic or Latinx	1(11.11%)	1(9.09%)
Asian	2(22.22%)	2(18.18%)
Disability		
Yes	1(11.11%)	2(18.18%)
No	8(88.89%)	9(81.82%)
Title		
Assistant Professor	1(11.11%)	1(9.09%)
Associate Professor	4(44.44%)	4(36.36%)
Senior Researcher	2(22.22%)	3(27.27%)
Professor	1(11.11%)	1(9.09%)
College Dean and Full Professor	1(11.11%)	1(9.09%)
Scientist	-----	1(9.09%)
Focus of Research		
Field/Applied Research	3(33.33%)	4(36.36%)
Behavioral Research	1(11.11%)	2(18.18%)
Clinical Research	1(11.11%)	1(9.09%)
Theoretical Research	1(11.11%)	1(9.09%)
Educational Research	2(22.22%)	2(18.18%)
Research Methodology and Quantitative Analysis in Social Sciences	1(11.11%)	-----
Employment Research	-----	2(18.18%)
Combination-Eclectic	-----	1(9.09%)
Highest Advanced Degree		
Masters	1(11.11%)	1(9.09%)
Ph.D./Ed.D.	8(88.88%)	10(90.91%)

fellows described their mentors as capable, uniquely qualified, helpful, available, flexible, supportive, smart/knowledgeable, and kind. They also indicated that mentors helped them to “grow professionally and personally” in the field of rehabilitation and research. One fellow reported that it helped to “have esteemed colleagues that have published a lot, have taken us under their wings in order to really mold us into better researchers.” Four fellows indicated that outside of the current post-doctoral fellowship at the LU-RRTC, they had never had a formal research mentor assigned to them. They, however, reported that they had informal mentors such as faculty members who served on their doctoral dissertation committees. It was thus refreshing for them to be assigned formal mentors who were invested in their success. One fellow commented:

The benefits of the formal research mentorship is the aspect of having someone who understands the developmental stage and process of creating competence in research. ... participating in mentorship provides me with someone who has patience while helping me grow.

Fellows' opinions were mixed regarding the idea of having multiple mentors. Some of the participants felt that sometimes having many mentors may not promote in-depth relationships. Specifically, they explained that it was not easy to connect and have a strong relationship with external mentors (i.e., mentors based at other institutions) “because people are busy.” Overall, there was general agreement that having multiple mentors was one of the innovative aspects of the model. One fellow discussed the benefits as follows:

The advantages of having multiple mentors is everybody has different strengths. ... one of my mentors is really good at stats. ... another one of my mentors is really good at literature reviews. So having multiple mentors provides you with different strengths which all together just come together cohesively to help build my research skills.

The fellows also discussed the advantages and disadvantages of having external mentors (i.e., those based at other institutions). Fellows felt that their relationship with mentors based at the LU-RRTC was much better than those they had with the external mentors. They attributed the experiences to the geographical proximity limitations and the COVID-19 pandemic safety measures that limited opportunities for face-to-face interactions. One fellow described the external mentors as “great in terms of supportive roles” but did not feel the “mentorship vibe” because “we see them like once a month.” One fellow explained:

Where with all the mentors in the center, like we see them every day, you do kind of have that mentorship vibe, which is really good. It feels like you do have like a big brother, big sister kind of, so to speak, in the academia sense, which is a good thing to kind of have the example and people to kind of give you the inside scoop.

Feeling safe and receiving support needed to accomplish the goals of the P3M emerged as critical to having quality mentoring experiences. Overall, all fellows reported that they felt greatly supported by the mentors. Fellows reported that although the mentors

were busy, they always “made time to meet with us.” One fellow commented:

I feel very comfortable, where I can ask questions if I'm uncertain about some-thing and it's not looked down upon. It's kind of really helping me become better, and it's a safe space. And so that's within the work environment as well as the personal realm as well.

Fellows also described the department and the university in general as a family. One fellow, reflecting on the family atmosphere noted, “and that really helps coming from an environment where I don't have any family here, and so that's what I really like about it.”

Collegiality and Mutual Respect

All fellows and mentors identified collegiality (i.e., mutually beneficial disposition of colleagues or peers toward each other) as one of the factors that contributed to a positive mentoring relationship. Participants identified friendliness, willingness to help, active listening, great communication, and sharing knowledge and resources as some of the attributes that contributed to a collegial atmosphere. Working as a team was not always a linear process. At the initial stages, fellows felt some anxiety as they were not sure how they would fit into the research team considering unique personalities, epistemological and ontological orientations, and each individual's “way of writing or conducting research.” With the help of the mentors, the fellows “were able to navigate that experience” of team formation. Subsequently, they reported that “we do work well as a team.” Fellows and mentors described that their relationship overcame the hierarchical gap that existed at the beginning of the mentorship and evolved into a peer relationship characterized by mutual respect. During the interviews, one fellow reported: “I have excellent, excellent relationships with my mentors. I mean, they are my colleagues. They're my mentors. They're my peers. Communication is open ... I have not had such an experience in life before.”

Professional Relationships

The development of professional relationships repeatedly emerged as one of the advantages of participating in the model. The fellows and mentors felt that the P3M gave them the opportunity to get to know each other professionally and personally. One of the fellows, for example, noted that “I have developed a life-long relationship with my mentors; that relationship just does not end because of the closure of my fellowship. The relationship between fellows and mentors was perceived as collegial, relatively formal, and developmental. Participants described that developing good working relationships was largely based on shared interest.

Team Science

Working in teams to learn and produce scientific knowledge was identified as a significant experience for both fellows and mentors. All fellows did not have experience working in teams whose major goal is to advance the science. Thus, they found the team science experience very rewarding. The research team approach gave fellows a framework to maximize their strengths while learning to enhance areas they felt were weak. Noting that people have “different areas in which we work best and strive”, one fellow observed:

This is my First time in my scholarly world to work with a team, a team that thinks and works together, share ideas together, develop deliverables together.

Benefits of Participating in the Model

The benefits of P3M transcended the fellows' personal development. This section provides a summary of benefits associated with participating in our model as perceived by fellows and mentors.

Research Skills and Knowledge

Fellows and mentors described advanced research training and mentorship as vital for building research skills and knowledge. At the beginning of the fellowship, all participants, although at varying degrees, identified inadequate knowledge, skills, and experience conducting research as some of their weaknesses. For example, one fellow identified "not being as proficient in analyzing quantitative results via SPSS, uncertainty of particular research topics I am interested in and whether they are relevant to the current problems existing in today's times." At the end of the program, fellows reported that their research skills and knowledge (e.g., quantitative and qualitative methods, data analysis, literature review, technical writing skills) increased. One fellow noted that, "I improved my qualitative and quantitative research skills by participating on various research teams."

Reflecting the time spent providing mentorship services, one mentor noted that P3M "has allowed me to share my expertise with regard to methods and analysis while gaining some new knowledge about specific topic areas that are of interest to the fellows." In addition, there was consensus among fellows and mentors that the P3M was successful in helping fellows both develop their grant-writing and manuscript development skills and expand their knowledge. Fellows, in particular, who did not have any prior experience writing and submitting federal research grants for funding consideration expressed their excitement learning "about the federal grant-writing process." Mentors corroborated the observations of fellows as one of them noted that, "generally, they [fellows] have gained great understanding of how to identify fundable topics, develop a grant proposal from the beginning to the end, correctly interpret requests for proposals, etc." One fellow noted:

And I think for me what was beautiful was seeing how all of the collaborators came together and everybody had their different strengths... I got to see exactly how the RRTC writes the grants and detailed everything.

Confidence

When the fellows began participating in the model, they identified lack of confidence in R&D spaces as a major challenge. For example, one of the fellows shared that "I feel intimidated by current and well-established researchers." Another fellow identified 'fear of publication rejections' and 'producing research results that do not add to the body of knowledge' as some of the barriers to conducting research. Corroborating the fellows' self-assessment, one mentor commented that "generally speaking, the fellows exhibited 'cautious, beginning confidence' early on. Most of the fellows seemed to be seeking some starting validation from the men-

tors in the beginning." Evidently, doctoral-level training programs, by themselves, are not sufficient for enhancing some graduates' confidence to conduct rigorous research and meaningfully participate in discourses involving eminent research scientists. Fellows, however, described that their confidence grew and became stronger throughout the program. By the end of the advanced research training, all fellows exuded confidence to conduct research. One fellow stated, "I feel more confident than I did prior to beginning my fellowship. I am more confident particularly in designing the methodology components." Fellows identified submission of manuscripts for publication and grant writing as some of the key factors behind their confidence.

Mentors identified several factors that they believed helped fellows feel more confident about their capacity to conduct research. These features included involving them in on-going projects, validating their experiences, providing relentless positive support and encouragement, focusing on fellows' individual assets as a basis for continuous quality improvement, self-disclosure regarding their successes and failures, encouraging them to attend and present at conferences, jointly conducting data analyses and writing papers for publication together, and providing positive feedback. One mentor noted:

I used a strength-based approach - where I focused on their strengths and not their shortcomings. I provided feedback in a positive way and I encouraged them. Sometimes I shared my personal experiences of 'failure' and 'successes' to inspire them.

NIDILRR Grant Expert Panel Reviewer Participation

Grant expert panel peer reviewers play a critical role in advancing the science as federal funding agencies such as NIDILRR and nonprofit organizations rely on their recommendations to make funding decisions. Unfortunately, scholars based at HBCUs are oftentimes underrepresented as reviewers on federal agency research grant competition sections and panels. Four of the five fellows appeared excited as they discussed their experience serving as expert panel reviewers for NIDILRR grant competitions. The fellows reported that it was their first time serving in that role. One Fellow excitedly commented, "I've been able to serve on grant competitions with NIDILRR."

Experience Teaching

Some of the fellows discussed the importance of having an opportunity to teach graduate level courses. One fellow noted, "I've been granted the opportunity to teach in academia a masters level rehabilitation and disabilities studies course to really see what some of the new, I guess, students look like coming into the field and where the field is heading as far as in academia."

Collaboration and Networking

Consistent with social network theory, the P3M offered opportunities for collaborations and networking. For example, all post-doctoral fellows had extensive collaboration interfaced with outstanding research scientists in the field from MSIs, research institutes and foundations (e.g., Kessler Foundation and ICI), PWIs, and federal agency staff (e.g., NIDILRR and NIH). Some of the outcomes associated with collaborations and networking included access to scientific information, authorships and co-authorships on

refereed publications and monographs and technical reports/policy research briefs, research proposal development and submission to NIDILRR and other federal agencies for funding consideration, increased self-confidence, and career development trajectory. All fellows and mentors credited P3M with making it possible to work collaboratively on research projects. All of the fellows reported that they collaborated on research proposal development, manuscripts for publication, and making presentations at national and international conferences. Commenting on the collaboration experience, one fellow stated, "I have also gained additional skills when it comes to grant-writing, collaboration, etc."

Corroborating the fellows' self-assessment, one mentor noted, "Fellows also enhanced their networking and collaboration skills, which are essential in R&D world. I think their interpersonal skills were also enhanced." In addition, mentors also agreed that P3M allowed them to establish professional networks and collaborations, as reflected in the following comment: "I developed additional networks with mentors and fellows; I got to travel to present research with fellows; I achieved additional co-authorships, I co-authored additional research grants and enhanced my research skills as well."

Leadership Skills

A distinctive feature of P3M is its focus on providing leadership experiences for post-doctoral fellows. Fellows and mentors generally agreed that they developed leadership skills such as relationship building, negotiation, conflict management, problem solving, initiation, cultural sensitivity, giving constructive feedback, and effective communication. These skills are critical when leading scientific collaborations/team science and in carrying out and managing research duties and responsibilities. One fellow observed that "overall, the networking opportunities, teaching opportunities, and leadership opportunities (CSI) were good." Corroborating the views of the fellows, one mentor stated that one of the advantages of P3M is the opportunity to "develop leadership and management qualities." Another mentor commented that "they [fellows] have enhanced their leadership skills, especially leading research teams to write proposals." In alignment with the objectives of P3M, mentors assessed their participation in the model as an opportunity to help develop the next generation of equity research leaders. One mentor commented:

One of the advantages is that I am helping facilitate the growth and development of the next generation of research leaders who, I hope, will contribute to eliminating long lasting disparities ... I feel this sense of fulfillment knowing that I have been part of this noble effort of mentoring the next generation of research leaders.

Empowerment

Mentors also sought to empower fellows as a strategy to increase the fellow's confidence. Empowering fellows at MSIs is especially critical as it allows them to not only claim their rightful space in the R&D enterprise, but also challenge the existing unequal status-quo power dynamic by advancing initiatives that promote equity among multiply marginalized persons of color with disabilities. One mentor noted that "stressing empowerment and self-determination over their own research products and research agenda" was useful in building their confidence. The main

indicators of increased confidence in the fellows, according to one mentor were "(a) more active involvement in group discussions, (b) a growing willingness to defend their own research ideas with rationale, and (c) producing more draft research products for review and feedback."

Participants also viewed P3M as empowering them to understand gender issues in higher educations. Specifically, female post-doctoral scholars appreciated the opportunity to have candid and empowering discussions regarding challenges and opportunities in the higher education landscape. One Fellow shared:

As women of color in the field, I feel like we had a couple of good, really good discussions on what that looks like in navigating kind of from a behind-the-scenes approach some of the things that might be more covert and less on the surface that you would deal with and face in higher education. And so that was helpful.

Personal Prestige and Reputation

In addition to experiencing personal prestige, fellows also reported that participating in P3M increased their reputation as a result of their research productivity, connection with important scholars, and expanded research skills and knowledge. Because of their increased visibility within and outside of their immediate circle of contacts and colleagues, people wanted to connect and collaborate with them. This experience not only made them feel prestigious but also enhanced their self-worth. One fellow stated that:

So, I could say that's been beneficial, like getting phone calls and people from years ago asking for me to be involved in certain projects, to check the _____ as well. Things that I would do for free out of interest, but being able to be paid to do research and interviews and different things, that's a cool side benefit. So just more than that, I could say having a reputation of being known as a scholar. That's nice.

Job Placement and Academic/Research Career Development

Another benefit of participating in P3M concerns job placement prospects and career development for fellows after completion of the training. Two mentors from South Carolina State University and North Carolina Technical State University also served as career mentors. They provided fellows guidance around potential pitfalls of securing an academic position. Three fellows secured faculty positions at HBCUs. However, one declined a position citing personal reasons and COVID-19 pandemic challenges. Placing fellows in a faculty or professional research position at MSIs, preferably, or PWIs was a key objective of this advanced research training initiative.

Attitude Change

Fellows also reported change of attitude. Within the context of research, positive and negative attitude toward research can have an empowering or disempowering effect on post-doctoral scholars, respectively. Moreover, positive attitudes about research at MSIs is vital in developing acritical mass of diverse researchers. One fellow commented that "there's a lot of benefits that I have really gained as a person, including my attitude towards some things in life and relationships and how to relate with others."

Research Productivity

One of the core aims of the P3M was to increase scientific productivity among post-doctoral fellows. For the current assessment, performance measures were number of authorships and co-authorships on publications (e.g., peer-reviewed journal articles, monographs, technical reports/policy briefs), grants submitted to federal agencies for funding consideration (funded and unfunded), and presentations. Overall, there was consensus among participants that fellows' research productivity increased. Fellows were very excited to report that, for the first time in their career, they were able to develop and submit research grant proposals to NIDILRR, the federal government's flagship disability research agency. They were also exuberant about their publication record. Fellows appreciated their proposal development experiences even though most of them were not funded. They also explained that presenting at conferences afforded them opportunities to network, receive constructive feedback, and interact with seasoned researchers. One fellow stated, "I've been able to present my research at national and international conferences." National and international conference participation (i.e., continental U.S., U.S. territories [i.e., Guam], and Kenya) also helped them and mentors rediscover their strengths and challenges. For example, one fellow discussed how travelling to present research at conferences illuminated the challenges of interacting with a large group of people for an extended period of time and the beauty of gaining cross-cultural knowledge. Increased research productivity demonstrates the potential for postdoctoral program contributing toward a critical mass of researchers at HBCUs and other minority serving institutions. Table 4 shows fellows' research productivity (i.e., co-authorships, grantsmanship, and professional presentations). Research productivity reflects our team science approach to knowledge production and dissemination. Although the evaluation of the model ended on February 9, 2021, some of the fellows' contract of employment ended about two months later.

Perceived Effective Research Skill Building Model Components

Overall, all fellows and mentors (except one mentor) reported that they were "very satisfied" with the model. One mentor, for example, stated that "I am very satisfied with the Peer Multiple Mentor Model. It was an honor to serve the profession in this capacity." In addition, most of them indicated that they would like to continue as mentors. Participants also felt that the structure of the model was excellent. Some of the positive features participants perceived as effective included availability of capable mentors and role models, practical hands-on experience in developing and submitting a research proposal, weekly meetings, a combination of one-on-one and group meetings, publication opportunities, networking and

collaboration opportunities, participation in communities of practice, availability of resources and support, and the research-team science approach (i.e., working together as team on research projects). One fellow described the model as "a pretty good one. Very hands-on. A lot of opportunities. It's very research-focused in terms of developing technical writing skills." One mentor, however, appeared not understand all the components of the model. A need therefore exists for periodically re-orienting mentors to the various components of the model even though they may not be involved in every aspect of the model. For example, mentors were generally not required to get involved in the community of practice since they had very busy schedules.

P3M Strategies or Components to be Considered for Adoption

As part of the evaluation of P3M, fellows and mentors were asked to provide their opinion on strategies or components of the mentorship model that they thought could to be considered for adoption by other MSIs, NIDILRR, and other federal agencies. Information collected through surveys, telephone interviews, and document review revealed the existence of general consensus among them that all components (e.g., multiple mentors, grant-writing and manuscript development, didactic classroom instruction, opportunities to teach, opportunities to develop individual research projects) of the models should be considered for adoption by MSIs and federal agencies. One mentor commented: "Because minorities are heterogeneous and diverse in geographic location across the country, I think the wide geographic reach of this model is what impressed me the most." Some fellows singled out the opportunity to receive mentorship from multiple and experienced research leaders as an effective strategy. In addition, participants perceived P3M as critical for developing a critical mass of equity researchers of color. One fellow underscored the importance of diversity in research:

There's a need for more researchers to be able to generate more knowledge about people of color, minorities, and so I would suggest that there is a need to increase the number of mentors and postdocs in HBCUs or minority-serving institutions. Because when you look across the board they are fewer as compared to say Whites and the rest, and so there is a need for more researchers and more postdocs, which means more funding.

One mentor observed:

The entire model with emphasis on several of the strategies I used, which are embracing unconditional positive regard and meeting fellows where they are starting, a focus on building a personal research agenda, learning basic research idea conceptualization, and adopting an assets perspective in working with/encouraging and empowering fellows.

Fellows argued that HBCUs and other MSIs should receive increased funding to implement the model as a strategy to "increase the number of qualified researchers and mentors." One fellow commented:

I would say NIDILRR needs to consider improving funding for research so that, as you know, institutions like Langston can have more postdocs. Because post-

Table 4

Post-Doctoral Fellows' Research Productivity During P3M Participation

Fellow	Duration in Fellowship	Co-Authorships (peer reviewed journal articles)	Policy briefs & monographs	Grants submitted	Number of Presentations
Fellow 1, complete	12/17 – 7/21	10	2	7	20
Fellow 2, placed before complete	11/17 – 9/18	3	1	4	5
Fellow 3, complete	12/18 – 1/21	6	1	3	6
Fellow 4, complete	2/19 – 4/21	5	1	3	2
Fellow 5, complete	4/19 – 4/21	5	1	2	1

docs contribute a lot to research about disability. Also see how best NIDILRR can fund more mentors so that HBCUs can have more mentors that will help in mentoring upcoming scholars, you know, scholars from ethnic minority groups.

Implementation Challenges

Like many advanced research training programs, implementing P3M at MSIs or within any context is prone to various challenges. Issues participants experienced in the course of model implementation included COVID-19 pandemic associated disruptions, lack of adequate experience working in research teams, time management, and scheduling conflicts. Some of these challenges were not surprising, especially to mentors. For example, at the beginning of P3M one mentor, in a survey response, commented, “I anticipate that time management may be a problem that needs to be addressed. It is possible to have communication issues and even misunderstanding regarding expectations.” However, participants never anticipated the COVID-19 pandemic. Table 5 shows themes and illustrative exemplars on challenges as reported by fellows and mentors.

Solutions to Implementations Challenges

To address P3M implementation challenges requires preparation, creativity, innovation, and mutual understanding among participants, including the funding agency. Based on this understanding, both fellows and mentors used a variety of strategies to address anticipated (e.g., scheduling conflicts) and unanticipated challenges (e.g., COVID-19 sequelae) encountered. Fellows, for example, used strategies such as seeking guidance from mentors, enhancing critical thinking, setting aside time to focus on research, staying organized, open and honest communication, and adopting behaviors from mentors who served as role models. One fellow commented:

Well, I voiced my opinion and I told my mentors that I’m struggling in this area and I need some additional help. And so, I think that’s the best way to overcome the challenges is to identify it, express it with your mentor, and then come together with a solution that can help.

Strategies mentors used to address challenges include providing emotional support, reaching out to fellows after reviewing their work to provide one-on-one feedback, setting time aside to focus on mentorship activities, using various methods to communicate (e.g., emails, phone calls, zoom), and providing fellows with best practices when seeking feedback. One mentor commented:

A suggestion was made for fellows to target their requests for feedback on particular issues or sticky problems they were facing, and this made it easier to know what to focus on and how to offer the most useful assistance.

Mentors also discussed ways they responded to COVID-19 pandemic as well as protests and social unrest that erupted in many cities across the U.S. and the world. COVID-19 and the protests were part of the lived experiences of the participants. One mentor commented that “we processed feelings and experiences related to COVID as part of our monthly agenda. We also provided a safe space to discuss the impact of racial tensions due to political un-

rest.” In addition, mentors provided social support, increased their communication with fellows, and encouraged fellows to pay attention to self-care. Mentors also emphasized their own self-care needs.

Discussion

In this qualitative study, we evaluated P3M, which was designed to improve MSI-based post-doctoral fellows’ research skills (i.e., methodology and grant-writing). The evaluation involved the use of surveys, telephonic in-depth interviews, document review, and observations. The results illuminated some of the mechanisms through which positive mentorship experiences were established. They include having capable multiple mentors, providing a safe and supportive environment, collegiality and mutual respect, professional relationships, and team science. These findings are consistent with mentoring studies, which have found that positive mentorship relationships are a result of an interplay of many factors related to the behaviors and actions of mentors and fellows, program design nuances, and the institutional environment (Moore, Manyibe, Aref, et al., 2017; Moore, Manyibe, Sanders, et al. 2017; Moore et al., 2021; Worthington et al., 2016). In addition, the findings support the notion that post-doctoral fellows need multiple mentors to help them navigate the contours of a complex R&D enterprise. Therefore, one of the intentions of using multiple mentors in the model was to help post-doctoral fellows adapt to the ever-changing workplace and a complex scientific ecosystem that

Table 5
Themes and Illustrative Exemplars on Challenges as Reported by Fellows and Mentors

Theme	Illustration	Participant
Time constraints	None other than the usual time constraints we all experience as very busy people.	Mentor
Scheduling conflicts	Balancing responsibilities at times and meeting deadlines. At times there were heavy research responsibilities, especially during grant-writing periods and attending/ preparing for conferences. There were times I could not make the group feedback sessions because they were always on the same day of the week and I wasn't always able to reschedule my clinical appointments on that day.	Fellow Mentor
COVID-19 pandemic related disruptions	The primary challenge was addressing the impact of COVID on the mentoring relationship. COVID caused us to go online or zoom, which presented some challenges in managing research.	Mentor
	Because of COVID-19 pandemic, [fellow x] has not been placed in her research practicum.	Mentor
	Due to the pandemic protective measures, we lost the face-to-face contact I was used to and I had to rely, like everyone else, on electronic communication (e.g., Zoom). COVID-19 was a major stressor especially for the fellows.	Fellow
Disconnection	I felt that a major part of the experience was missed. I never got the opportunity to complete an internship to see how all of this works in practice with the consumer population and supervising a program etc.	Fellow
Adapting to the team science	One challenge was being asked to review mentee literature reviews and having very little context for the narrative's purpose. And trying to come together as a team, there were some issues in-so-far as how to actually write the paper or the particular section. “But we were able to navigate that experience, where we talked to our supervisor and they helped us go through that process. But other than that, the collegiality is good. We do work well as a team. It just started out coming from different backgrounds and having different strengths and weaknesses, and that created a problem in the beginning. But we were able to talk it out and get everything solved.	Mentor
Inadequate Data Analysis skills		Fellow
Workload	I think the challenge I’ve experienced is that I’m not a strong data analyst and so one of the things that I wanted to get out of this program was to strengthen up my skills	Fellow
	We have a lot of research projects going on. We have grants _____ and sometimes there's too much to do with little time, so sometimes you have to work overtime like work quite late in order to meet some deadlines.	

is constantly responding to technological advancements, forces of globalization, (Eby et al., 2006; Johnson, 2013; Sternberg, 2013; Moore et al., 2021), and sociocultural transformations at local, national, and international levels.

Consistent with the social network theory, fellows and mentors explained that the combined strengths of multiple mentors came together cohesively to help build their research skills. Based on this finding and our experiences, we recommend that effective advanced rehabilitation research training models should pair fellows with at least three mentors that include both senior and junior colleagues who have connections with influential actors within the R&D arena. A majority of these mentors, where possible, should be employed at the institution housing the fellowship; hence a critical need exists for developing research leaders at MSIs to serve as mentors and role models to fellows, fellow faculty members, and students. Additionally, the mentors should be committed to scientific workforce diversity efforts and the new paradigm of empowering minority serving institutions to nurture and develop early career equity investigators.

We recognize that in successful mentoring, mentors and fellows engage in a collaborative interprofessional learning relationship (Moore, Manyibe, Aref, et al., 2017; Moore et al., 2017; Moore et al., 2021; National Research Council, 2015; Ragins et al., 2012). Within P3M, the mentorship relationship is conceived as relational, developmental, and contextual (Ambrosetti & Dekkers, 2010). The developmental conceptualization of the model focuses on mentoring functions and behaviors that foster research skill building as well as professional and personal development of both fellows and mentors. The contextual component is concerned with situational characteristics (e.g., institutional and administrative culture, research environment, missions, and geographies) that are unique to MSIs (Ambrosetti & Dekkers, 2010; Moore et al., 2021).

In addition to completing the P3M, findings indicate that post-doctoral fellows felt strongly that their research productivity (as measured by peer-reviewed and non-refereed publications, grants submitted for funding consideration, and number of presentations), which were the primary goals of the program, increased. Fellows submitted, for the first time in their career, proposals to NIDILRR and also increased their publications. Consistent with previous studies (i.e., Moore, Manyibe, Aref, et al., 2017; Moore, Manyibe, Sanders, et al. 2017; Moore et al., 2021; Steinert et al., 2012), participants identified key aspects of the model such as capable multiple mentors, safe and supportive environment, collegiality and mutual respect, professional relationships, and team science, as major drivers of successful mentorship experience and outcomes. Scholars have indicated that teamwork in research also enables thorough methodological design, increases rigor, and encourages richer conceptual analysis and interpretation (Holden et al., 2012; Manyibe et al., 2015). Although only two fellows participated on a grant-writing team that was awarded a NIDILRR grant, the fellows and mentors reported satisfaction with the outcome, noting that “rejection” is part of the competitive nature of grantsmanship and overall development in the research arena.

Our research suggests that participation in P3M has several benefits such as research skills and knowledge enhancement, increased confidence to conduct research, grant review panel participation, experience teaching, opportunities to collaborate and network, and leadership skills development. In addition, fellows singled out the grant-writing training as an effective strategy for providing them awareness-level information about available R&D funding opportunities within NIDILRR, NIH, other federal agencies, and nonprofit organizations.

We know from research that mentoring networks are of particular importance to faculty at MSIs, including those with disabilities, who are less likely to find role models or capable mentors available to address their research career development needs and help them navigate the complex contours of the R&D enterprise. According to the social network theory, less connections often mean that individuals are exposed to less scientific information and resources, which in turn relegates them to the periphery of the scientific ecosystem. On the other hand, highly connected researchers tend to be more influential, and benefit more through cross fertilization of knowledge and shared resources (Moore, Manyibe, Aref, et al., 2017; Moore, Manyibe, Sanders, et al. 2017; Moore et al., 2021). In alignment with the social network theory, opportunities within the P3M for networking included connecting post-doctoral with multiple mentors from within and outside the RTTC; supporting them to attend national and international professional conferences, providing them the opportunity to engage with NIDILRR, NIH, and other federal agency decision makers; participating in communities of practices that consist of diverse scholars from MSIs; and creating opportunities to have experiences with individuals with disabilities and their family members.

Unlike many traditional advanced rehabilitation research training models, this approach focuses on developing fellows’ cultural competence that acknowledges the importance of the social determinants of health in shaping and driving employment, health and function, and community participation outcomes among multiply marginalized people of color with disabilities. Research cultural competence education and training aims to enhance the ability of the fellows to meet the unique needs of diverse racial and ethnic populations when conducting research and ensure equity researchers of color participation in R&D. The ultimate goal of cultural competent research mentorship is to improve the experiences and outcomes (i.e., employment, health and function, community living and participation) of the target population, which enhances their overall quality of life (Moore et al., 2021).

The challenges affecting the implementation of the model included time constraints, scheduling conflicts, COVID-19 pandemic, and initial difficulties adjusting to the team science. These challenges reflect a complex interaction between individual, institutional, and systemic factors that characterize research capacity building interventions (Moore et al., 2021). To address these issues, mentors and fellows met regularly to monitor and evaluate progress and address emerging issues. For example, fellows were provided with strategies effective time management strategies such as scheduling meetings, having the ability to say no to activities that could jeopardize the mentorship experience, and ensuring effective communication through the use of information technol-

ogy solutions. The community of practices also helped fellows to think together in understanding their unique challenges. As fellows engaged in thinking together, they guided one another through their understanding of not only the technical, practical or theoretical knowledge (Pyrko et al., 2017), but also the understanding of practical solutions to challenges they were experiencing. Overall, participants were very satisfied with all components of the model and recommended that federal agencies and MSIs adopt the whole model for replication.

Study Limitations

This research has several limitations that could be considered in interpreting the results. First, one important limitation is the small sample size, and therefore, the findings may not be generalizable to other settings or individuals. In spite of this limitation, all fellows were based at an HBCU that mirrors various infrastructure assets, scientific performance and research capacity building nuances of its sister HBCUs across the nation. As such, these background similarities may bolster, although to an unknown degree, the applicability of the findings to other HBCUs. Moreover, it is important to also note that the multi-method data collection approach provided a fertile ground for the researchers to extract rich information from fellows and mentors that support the confidence in the findings. Second, the study relied on a convenience sample. Given the inherent bias found in convenience samples, it might mean that the sample was unlikely to be representative of post-doctoral fellows at HBCUs and other MSIs. Also, we were part of the mentors in this research. Given our positionality, we maintained throughout the research process, an informed reflexive awareness to contextualize our position in relation to the research process and research participants. In this process, we discussed and addressed any biases and assumptions throughout data collection, analysis, and interpretation (Bourke, 2014; Day 2012) thus ensuring that the credibility of the research process was maintained. Despite these limitations, this research has provided insight regarding the promise of the P3M for building MSI-based post-doctoral fellows' scientific skills.

Conclusion

Addressing inequities in employment, health and function, and community participation while maximizing the full inclusion and integration into society of multiply marginalized people of color with disabilities in the U.S. requires a comprehensive approach that includes the recruitment and training of post-doctoral fellows at MSIs. For this reason, there is urgent need for advanced rehabilitation research training models at MSIs. Within HBCU context, training and mentoring serve three broad functions. First, these initiatives enhance the skills of fellows and scientific teams to undertake high-quality rigorous research. Second, they serve as a research infrastructure development catalyst. Third, these activities help to construct a research training pipeline for developing a diverse scientific workforce. This study's results show that P3M is a promising advanced research training and mentorship model that could be used to develop the future cadre of well-trained equity researchers, including those with disabilities, available to lead and participate in multidisciplinary disability/health and rehabilitation aimed at advancing racial and ethnic equity. In addition, the model could help advance NIDILRR's purpose of improving the capacity

of MSIs to develop and support advanced research training opportunities. This model can be most successful when informed by social network theory and critical mass theories.

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Assistive Technology Workplace Accommodation and Employment among Diverse Populations with Disabilities: Does Race/Ethnicity Matter?

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The purpose of this study was to examine the relationship between assistive technology workplace accommodation (AT-WA) usage and employment status among racial/ethnic populations with disabilities. Chi-square tests and logistic regression were used to analyze secondary data from the 2015 Kessler Foundation National Employment and Disability Survey (KFNEDS). Results indicated that significantly more consumers who used AT-WA were currently working, and a significantly greater proportion of them were White. Moreover, a significantly lower proportion of those who did not use AT-WA had less expected odds of being currently employed. Specific implications are discussed to inform practices, policy, and/or future research.

Keywords: Assistive Technology, Racial/Ethnic Minority, Employment, Disability, Workplace Accommodations

Over 61 million Americans in the United States (U.S.) have a disability that impacts major life activities such as work (Okoro et al., 2016). Participation in the workforce is a valued activity that fully provides opportunities for people with disabilities to engage in social activities and enrichment, and vari-

ous economic benefits. Reasonable accommodations in the workplace serve a vital role in making employment for such individuals possible. The term “reasonable accommodations” defined in the Americans Disabilities Act (ADA) is any modification or adjustment to a job or the work environment that will enable an applicant or employee with a disability to participate in the application process or to perform essential job functions (Reasonable Accommodations in the Workplace, 2021).

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Examples of reasonable accommodations include alarms on a watch or phone, a color-coded filing system, computer screen

readers, modified work schedules, and adjustable desks. The ADA prohibits employers from declining to hire people with disabilities, or offering them lower wages, due to the perceived costs of reasonable accommodations. The ADA further extends full civil rights and equal opportunities to people with disabilities in both the public and private sectors. Specifically, the law prohibits discrimination based on physical or mental disability in employment, public services, public accommodations, and telecommunications. In cooperation with the ADA, assistive technology (AT) can help play a major role in complying with reasonable accommodations.

The most frequently quoted definition of assistive technology derives from the Technology-Related Assistance of Individuals with Disabilities Act of 1988. Subsequently, renamed the Assistive Technology Act and amended, this law defines assistive technology as any item, piece of equipment, or product system, whether acquired commercially or off the shelf, modified or customized, that increases, maintains, or improves functional capabilities of individuals with disabilities. Assistive technology is considered either “low, mid, or high tech” depending on the device’s complexity and the materials used to produce it (Inge, 2006).

AT offers a wide range low-tech and high-tech devices that directly support individuals with disabilities participation in productive work. For example, Low- tech AT devices usually are inexpensive and easy to purchase or make. Additionally, low-tech AT does not necessarily require specialized training to identify or create and is relatively easy to implement for individuals with disabilities (e.g., apparatuses that lower the height of a desk, squishy balls to help relieve stress tension and boost focus, walking canes). High-tech AT devices would be the use of electronics, special manufacturing techniques, and materials. Generally, high-tech AT can be obtained from a specialized service provider (e.g., rehabilitation engineer; rehabilitation counselor; occupational, physical, or speech therapist) and requires additional assistance for the user. See Table 1 for examples of AT devices as reasonable workplace accommodations for various disability types.

The receipt of AT-WA (e.g., screen readers, ergonomic workstations, screen clips, and microphone headsets) by employees with a disability has shown positive association with continued employment and delayed labor force exit (Von Schrader et al., 2014; Hill et al., 2016; Kristman et al., 2016). Moreover, AT-WA is an essential vocational rehabilitation service for employees with disabilities. AT can address the interface between personal characteristics such as functional limitation in mobility, cognitive, or communication domains and the work-place environment to facilitate the person’s performance of job-related activities. The demands for AT-WAs are increasing dramatically in part due to increasing disability rates, modern technological advancements, and both Section 508 of the Rehabilitation Act and Title I of the Americans with Disabilities Act enable more AT-WAs. However, only between one-quarter and one-third of individuals with a disability receive employer accommodations to help them retain employment (Hill et al., 2016; Anand & Sevak, 2017).

Employment retention is one issue, but acquisition is another. Persons with disabilities in the U.S., compared to those without disabilities, experience higher unemployment rates (Kessler Foun-

ation, 2017; Ross & Bateman, 2018; Schur et al., 2017). For example, recently, the U.S. Bureau of Labor Statistics reported that in 2019, persons with a disability were at a 19.3% employment-population ratio, compared to their counterparts without a disability at 66.3% (Persons with a Disability: Labor Force Characteristics-2019, 2020). Among unemployed persons with a disability, rates vary by racial/ethnic minority status (i.e., non-Hispanic White vs. individuals identified as non-Hispanic Black, Hispanic, Asian, Native American, or Pacific Islander).

While the unemployment rate for Whites with a disability has declined over the years, the rates for Blacks, Hispanics, and Asians have remained steady (Persons with a Disability: Labor Force Characteristics- 2019, 2020). Among persons with disabilities, Blacks reported the highest unemployment rate in 2019 at 11.8 %, followed by Hispanics at 8.6%, Asians at 6.7%, and Whites at 6.6% (Persons with a Disability: Labor Force Characteristics-2019, 2020). Thus, there is an existing unemployment gap among racial/ethnic minority groups and Whites as well as a gap between people with and without disabilities. These gaps contraindicate current predominant rehabilitation practice progress, which is that technological developments and public policies have improved accessibility for people with significant impairments and chronic health conditions to work.

Some studies have examined employment barriers persons with disabilities (Cichy et al., 2017; Sevak et al., 2015; Sundar et al., 2018; Yin & Shaewitz, 2015). The types of barriers that have been identified throughout the literature include social and public policy (Mitra & Kruse, 2016; Livermore & Honeycutt, 2015; Nogueira et al., 2016), workplace accommodations (Anad & Sevak, 2017; Cook & Burke-Miller, 2015; Kristman et al., 2016;

Disability Type	AT Device or Service Workplace Accommodation
Vision	Large print materials. Computer with voice input. Electronic note taker. Raised lettering on room labels. Accessible company websites.
Hearing	Real-time captioning for conferences and audio streaming of web teleconferences. Certified sign language interpreter. Teletype telephone. Telephones with amplification devices and visual and auditory alerting systems.
Lower Mobility	Adjustable/Ergonomic height desks and workstations. Sip-and-puff systems. Accessible Vehicles. Automatic Door Openers. Doorknob grips, light switch, and handle extenders. Ramps (e.g., portable and threshold). Stair lifts.
Upper Mobility	Trackball for easier mouse manipulation. Touch screens. Ergonomic keyboard. Speech amplification systems. Eye Mobility.
Cognitive	Memory aids (pop-up timer on computer, alarm set in phone). Flexible Schedule. Recorder Device. iPhone/iPad. Telephone auto-dialer. Voice output with optical character recognition to read documents or use a reading pen.

McDowell & Fossey, 2015), AT (Huang et al., 2016; Morash-Macneil et al., 2018; Shin et al., 2016; Ward-Sutton et al., 2020), low-socio-economic status (Chan et al., 2018; Jagger, 2017; Lindsay et al., 2018; Metcalfe et al., 2017; Kaya, 2018), and lack of vocational rehabilitation (VR) services (Cimera et al., 2015; Cross et al., 2015; Eckstein et al., 2017; Manyibe et al., 2012; Moore et al., 2016; McDonnall, 2016).

Although some studies have investigated the association between the employment of persons with disabilities and a wide range of factors, there is a lack of empirical research examining the interplay between employment and AT-WAs for persons with disabilities among racial/ethnic minority groups. If this interplay continues to be ignored, high unemployment among people of color (i.e., racial/ethnic minorities) with a disability will continue and possibly increase. While a broad spectrum of workplace accommodations exists, AT-WA is a specific strategy to improve employment outcomes for people of color (PoC) with a disability and is necessary to address the diverse needs of individuals with disabilities related to technological supports, as mandated in U.S. legislation.

The continued advancement and technological development of AT-WA requires attention to the critical role this specific type of support plays in the successful employment of people with disabilities. Evidence shows, enhanced effects of specialized placement, job development, and other supported employment strategies that would be otherwise difficult without the use of AT (Chiu et al., 2015; Hedrick et al., 2006; Inge, 2006; Morash-Macneil et al., 2018; Shin et al., 2016; Sundar, 2017). On a global scale, The World Health Organization (WHO) estimates that over 1 billion people globally currently need AT, but only 1 in 10 have access. It estimates that by 2030, due to the growth of disability and ageing populations, 2 billion people in the world will be in need of at least one AT device (Assistive Technology, 2018). Despite evidence about the advantages and increased demand of AT devices in the workplace, PoC with disabilities have not benefited equally from using AT (Ilunga Tshiswaka et al., 2016; Ward-Sutton, 2019; Ward-Sutton et al., 2020).

Furthermore, the available literature on diverse disabled populations and AT-WA usage is limited and illustrates a void in addressing AT's cultural and linguistic accessibility that would align with long-standing policies and practices (e.g., ADA and Assistive Technology Act). This area of research should focus on a range of racial/ethnic minority statuses, including various disability types and workplace accommodations. Therefore, this study's purpose was to use data from the 2015 Kessler Foundation National Employment and Disability Survey (KFNEDS) to first explore the relationship between AT-WA usage and employment status among individuals with disabilities. Secondly, this study examined the relationship among racial/ethnic minority statuses and AT-WA usage. Additionally, researchers investigated what factors impact usage of AT-WAs for individuals with disabilities. The KFNEDS provided a unique opportunity to examine these relationships because the data result from the first national survey to explore the workplace experiences of people with disabilities, specifically PoC, and identify successful strategies for finding and maintaining employment. Specifically, the following research questions were

addressed:

1. Is there a statistically significant relationship between AT-WA usage and employment status among individuals with disabilities?
2. Is there a statistically significant relationship between the racial/ethnic minority status of individuals with a disability and AT-WA usage?
3. Is there a relationship between racial/ethnic minority status and employment status among individuals with disabilities?
4. Is income, gender, social security benefits, education and age significantly related to employment status?

Methods

Sample

The KFNEDS was administered by telephonic interviews across the U.S. using randomly selected adults ages 18-64 with a self-reported disability. A sample of households was selected using the random digit dialing (RDD) procedure on both landline and cellular telephones. For the 2015 KFNEDS, a nationally representative sample of 3,013 adults with disabilities was interviewed by trained professional interviewers at the University of New Hampshire Survey Center and Pennsylvania State University Survey Research Center. A team of researchers from both survey centers conducted a secondary analysis of the 2015 KFNEDS dataset to identify the current study's sample size of 3,013 working-age adults (2015 Kessler Foundation National Employment & Disability Survey: Overview, n.d.).

Survey Design

The study utilized data collected from the 2015 KFNEDS, which contains information on Americans' experiences with disabilities in finding and maintaining employment from October 17, 2014, through April 23, 2014. In consultation with the Kessler Foundation and an advisory board, multidisciplinary researchers at the University of New Hampshire developed the survey questionnaire. The final version of the survey consisted of 64 items, inclusive of modified disability and employment-related questions from several national surveys such as the American Community Survey (ACS), Canadian Survey on Disability (CDS), and Current Population Survey (CPS) (2015 Kessler Foundation National Employment & Disability Survey: Overview, n.d.).

Since this study sought to investigate AT-WAs and employment among diverse populations with disabilities, AT related workplace accommodations (e.g., a PC, tablet, hearing device, captioning, upper body ergonomic accommodation, and vision software) among primary disability types (e.g., hearing, vision, cognitive, and upper mobility) were collapsed into two categories of (a) general AT accommodations received, or (b) no general AT accommodations received. For the employment status, six subpopulation categories of work-related experiences as defined within the KFNEDS were collapsed into two categories of the criterion variable: looking for work (e.g., working and are looking for work, previously worked and looking for work, never worked and looking for work) and not looking for work (previously worked and not looking for work, are working and not looking, never worked, and not looking). Race/ethnicity consisted of Non-Hispanic Whites,

Non-Hispanic Blacks, American Indians/Alaska Natives, Hispanics, Asians, Native Hawaiians/Pacific Islanders, or other. For the purposes of this analysis, a dichotomous variable was used to represent racial/ethnic minority status consisting of two categories reflecting those who identified as White and those who identified as belonging to any of the other categories.

Data Analysis Strategy

Descriptive statistics were generated to characterize the sample. Pearson's Chi-square Test was used to analyze dichotomous independent and dependent variables (Connelly, 2019). A logistic regression analysis was used for models containing two or more predictor variables (i.e., racial/ethnic minority models containing two or more predictor variables (i.e., racial/ethnic minority status, AT-WA) and a dichotomous dependent variable (i.e., employment status). Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 25, at a selected significant level of $\alpha=0.05$.

Results

Table 2 provides descriptive statistics related to the characteristics of all respondents of the KFNEDES sample. Overall, the total sample of 3,013 participants, 1675 (55.6%) were female, and 1338 (44.4%) were male. Slightly over half of the sample (53.2%) had an income of \$60k or more, followed by, those with an income of \$30k and less at 28%, and the remaining participants reported an income between \$30k to \$60k (18.6%). Among disability onset, during young age was reported the lowest at 26.3%, while disability onset during adulthood was most frequently reported at 50.1%. Regarding social security, of the total sample, 50.1% had received social security in the last two years, and 49.9% did not. Many participants (60%) had a high school diploma or GED and above; 40% reported less than a high school diploma or GED. In terms of employment status, 57.2% of the sample were currently not working, and 42.8% were currently working. An examination of AT-WA by racial/ethnicity status shows 24.7% of Whites with a disability utilize AT-WA. In comparison, only 9.2% of racial/ethnic minorities were most likely to use AT-WA. The largest age group represented were 55-64 years old, which accounted for 36.3% of the sample; 27.5% were 45-54 years old; 14.3% were 35-44 years old; 11.3% were 25-34 years old, and 8.4% were 18-24 years old.

Table 3 displays descriptive statistics profile summarizing the relationships among a broader range of variables investigated through the KFNEDES, including the most functionally limiting disability (i.e., respondents who identified more than one type of disability, where asked were asked about their most limiting disability), general AT-WA usage, and racial/ethnic minority groups. The descriptive profile summary showed racial/ethnic minority status respondents (i.e., non-Hispanic Black, Hispanic, Asian, Native American, or Pacific Islander) have a lower usage percentage of general AT-WAs across their most functionally limiting disabilities. The profile also indicated that respondents who identified cognitive, lower mobility, or upper mobility as their most functionally limiting disability types were more likely to have used general AT-WAs than other identifiable functionally limiting disability types such as hearing or vision.

Chi Square Analysis Results

A chi-square analysis addressed research question 1 by investigating the relationship between general AT-WA usage and employment status among individuals with disabilities. The overall sample analysis indicated that among those with no general AT-WAs, 36.4% are looking for work, while 63.6% are not looking for work.

Of those who received general AT-WAs, 55.1% are looking for work, while 44.9% are not looking for work. Overall, a higher percentage of individuals with a disability who received AT-WA reported actively looking for work 55.1% compared to 36.4% of individuals with no AT-WA usage, $\chi^2(1, N=3013) = 97.016, P < .05$.

A second, chi-square analysis addressed research question 2, the relationship between racial/ethnic minority status and general AT-WA usage was examined and found these two factors to be significantly associated $\chi^2(1, N=3013) = 6.074, P < .05$. Reports among individuals with no AT-WAs, indicate 75.7% were White

Nominal Variables	n	(%)
Sex		
Female	1675	55.6
Male	1338	44.4
Income		
<\$30,000	844	28
\$30,000 to \$60,000	561	18.6
>\$60,000 or More	1604	53.2
Disability Onset		
Young age	792	26.3
Adult	1509	50.1
Received Social Security in the last 2 years		
Yes	1509	50.1
No	1504	49.9
Education		
Less than High school diploma or GED	1205	40.0
High school diploma or GED and above	1808	60.0
Employment Status		
Currently Not Working	1723	57.2
Currently Working	1290	42.8
Assistive Technology Workplace Usage among Whites		
Yes	744	24.7
No	1495	49.6
Assistive Technology Workplace Usage among Racial/Ethnicity Minority Groups		
Yes	276	9.2
No	437	14.5
Categorical Variable		
Age		
18-24	253	8.4
25-34	340	11.3
35-44	430	14.3
45-54	830	27.5
55-64	1093	36.3
Do not know	67	2.2
Age		
18-24	253	8.4
25-34	340	11.3
35-44	430	14.3
45-54	830	27.5
55-64	1093	36.3

while 24.3% were from racial/ethnic minority background. For those that received general AT accommodations, 71.6% were White, while 28.4% were from racial and ethnic minority groups. In short, individuals with a disability who identified as a racial/ethnic minority were not any less likely to be provided with AT-WAs than their White counterparts and are more likely to use AT-WAs when received.

Logistic Regression Analysis Results

A logistic regression analysis addressed research question 3 by investigating the linear relationship between non-White race/ethnicity, AT-WA usage, and employment status, revealing the following results, while holding other variables constant. The OR estimate (OR=2.947, $p < .05$) suggests that the expected odds of being employed is 2.9 times higher for Whites using AT-WAs compared with otherwise similar minority individuals who used AT-WAs. Additionally, OR findings (OR= 1.447, $p < .05$) suggest that the expected odds of being employed are almost 1.4 times higher for Whites not using AT-WAs than otherwise similar minority individuals who did not use AT-WAs. Lastly, the logistic regression analysis results also indicated that the expected OR estimate (OR=3.083, $p < .05$).

Research question 4 investigated what factors predict the nature of employment status by individuals with disabilities? A logistic regression analysis investigated the linear relationship between income, gender, social security benefits, education, and age as pre-

dictors, with employment as the criterion. The logistic regression analysis indicated the following: individuals with a disability who earn less than 30K a year were less likely (OR=0.413, $p < .05$) to be working than individuals with a disability who were earning a higher annual income of 60K or above. Males with a disability were more likely (OR=1.448, $p < .05$) to be currently working than females with a disability. Individuals who received social security benefits within the last two years were less likely (OR=0.88, $p < .05$) to be currently working. Individuals with a disability who received some college and above were more likely to be currently working compared with those with lower education.

Finally, when examining age and employment results of the logistic regression analysis, individuals between the ages of 18-24 with a disability were more likely (OR=1.511, $p < .05$) to be currently working compared to persons ages 65 and above with a disability. Individuals between the ages of 25-34 with a disability were more likely (OR=1.639, $p < .05$) to be currently working compared to the ages of 65 and above with a disability, and individuals between the ages of 35-44 with a disability are more likely (OR=1.449, $p < .05$) to be currently working compared to persons ages of 65 and above with a disability.

Discussion

Despite evidence about the advantages and increased demand of AT devices in the workplace, PoC with disabilities have not benefited equally from using AT (Ilunga Tshiswaka et al., 2016; Ward-Sutton, 2019; Ward-Sutton et al., 2020). The current study results identified racial/ethnic minority status and AT-WA usage as variables significantly related to employment. In this regard, racial/ethnic minority status and general AT-WA usage have a significant effect on employment status for individuals with disabilities. These findings, in part, corroborate those from previous studies (Anand & Sevak, 2017; Sundar et al., 2018; Ward-Sutton et al., 2020) that identified workplace AT accommodations as a significant predictor of employment success for individuals with a disability. Additionally, findings highlight a greater need for AT-WAs among racial/ethnic minority statuses to help achieve greater success in their employment outcomes.

Employers, rehabilitation counselors, vocational rehabilitation (VR) service providers, and consumers in the field need more knowledge about the importance of providing AT workplace accommodations. In this study, there was a significant association between individuals with disabilities' general AT accommodation usage and striving to work. The results indicated 55% of individuals who used general AT accommodations were looking for work, while 60% of those who were not looking for work did not use general AT accommodations. Findings also point to a further implication for the underutilization of AT workplace accommodations as a potentially missed employment opportunity, which is unfortunate due to the available technologies and services that have made it easier and less expensive for businesses to employ individuals with disabilities.

To enhance clarity for the reader, we present the following recommendations given the findings of this study under the following two subsections (a) practice and (b) public policy to im-

Table 3						
Descriptive Findings: Comparison of Most Limiting Disability General AT Accommodations Usage Across racial/ethnic minority status						
Most Limiting Disability	General AT Accommodation "Yes" or "No"	White		Minority		Total
		n	%	n	%	
Vision	Yes	35	59.3	24	40.7	N=59
	No	65	69.1	29	30.9	N=94
Hearing	Yes	43	87.8	6	12.2	N=49
	No	154	89.0	19	11.0	N=173
Lower Mobility	Yes	151	67.7	72	32.3	N=223
	No	322	71.7	127	28.3	N=449
Upper Mobility	Yes	127	70.2	54	29.8	N=181
	No	227	72.3	87	27.7	N=314
Cognitive	Yes	226	74.3	78	25.7	N=304
	No	364	77.6	105	22.4	N=469
Other	Yes	121	73.8	43	26.2	N=164
	No	271	77.4	79	22.6	N=350
Missing or Don't Know	Yes	41	69.5	18	30.5	N=59
	No	92	73.6	33	26.4	N=125
Total	Yes	744	71.6	295	28.4	N=1039

prove AT-WA usage and delivery for the successful employment of individuals with disabilities from racial/ethnic minority groups.

Implications for practice

In terms of practice, service providers (e.g., rehabilitation counselors and vocational rehabilitation (VR) practitioners) play a critical role in consumers' needs and are significantly impacted by the availability of resources or lack thereof. Our findings provide three critical recommendations to examine potential inequities in the need for or the receipt of actual AT-WAs:

1. Practitioners should stay up to date on current multicultural training and interventions, research findings, and recommended interventions to meet racial/ethnic minority group needs. For example, they could be made aware of the results of this current study as a starting point. Doing so, could help establish a foundation in which the experience of all consumers' basic needs is identified and addressed with more attention, focus, and cultural sensitivity during the provision of services.
2. Provide appropriate competencies and services regarding AT workplace accommodations (e.g., utilize AT specialists, assessments, and training). This strategy would help ensure all consumers appropriate access and opportunities for AT workplace accommodations while also enhancing a collaborative relationship for employers and consumers to understand AT reasonable accommodations and options.
3. More practitioners should encourage and increase the number of consumers who might possess the skills and potential to benefit from AT workplace accommodations. Such exposure could positively impact the knowledge and usage within the disability community. Moreover, results of this study could be used to inform key stakeholders (e.g., policy makers, state, and federal funding agencies) about enhancing participation in AT workplace accommodations across racial and ethnic minority groups.

Implications for policy

The following three public policy recommendations emerged from the study findings that authors consider relevant to address specific needs of individuals with disabilities from diverse racial/ethnic populations.

1. Provide equal racial/ethnic minority status representation among public policy makers and other key stakeholders that design or provide judgment on AT-WA matters to ensure fairness among all individuals with disabilities. Such adequate representation will help increase the level of transparency between policy makers and the people of color in the disability community. For example, greater resources and attention need to be directed to increasing AT information access in Spanish. The Hispanic population is estimated to reach 111 million by 2060 (Persons with a Disability: Labor Force Characteristics - 2019). Online availability of AT information in Spanish is limited but crucial to increasing AT utilization among Spanish-speaking people with disabilities. Policy makers can address the cultural and linguistic accessibility of AT information available on

state AT program websites by aligning practices with long-standing and more recent policies (e.g., E.O. 13166 and Section 1557 of the Patient Protection and Affordable Care Act) (Secretary & (OCR), 2021) to promote equity and access.

2. Current policies and funding agencies should review the inventory of all funding streams designated for AT workplace accommodations across recent projects, agencies, providers, etc., to identify effective efforts and to recommend dedicated funding or new incentives to increase successful employment outcomes and AT workplace accommodation usage among racial/ethnic minority groups with a disability. Coordinating efforts across state AT programs would support developing a repository of materials for circulation and assist programs as they expand the information available to better match demographic and linguistic needs. Specifically, this will help address a diverse society's emerging needs and promote social justice by connecting funding resources to communities in need.
3. Public policy makers and stakeholders should consider developing better strategies for knowledge translation and disseminating AT-WA policies (e.g., publishing policies and procedures periodically and coordination of national workshops or trainings) for employers and consumers. Information provided should be easily accessible and recognizable to the general public. This targeted intervention may positively impact the disability community by (1) supporting self-advocacy opportunities, (2) placing a higher value on employers' participation in staying abreast of current and emerging best practices for AT-WAs as well as helping reduce the experiences of bias and discrimination in the hiring of individuals with disabilities, specifically from diverse populations.

Limitations and Future Research Directions

Although this study has several strengths, for example, findings are among the first to illuminate relationships across AT-WAs and employment among racial/ethnic minority populations, some limitations are noted. First, the 2015 KFNEDES utilized a self-report methodology; thus, there is no way to confirm the validity of all responses given nor that all respondents had a concrete understanding of the concepts involved. Secondly, the 2015 KFNEDES used proxy respondents instead of actual respondents for individuals who had difficulty speaking English or speaking on the telephone. Additionally, proxy respondents were used for individuals with severe cognitive impairments or communication difficulties. Lastly, categorical variables from the 2015 KFNEDES were collapsed for conducting data analysis, which impacts the study's generalizability of findings. Despite these limitations, the findings may be helpful to inform rehabilitation counseling policy makers, practitioners, and future research interested in enhancing minority AT-WA and employment success rates.

Future research should investigate these variables' role on AT-WAs and employment outcomes to develop more keenly targeted interventions that can be used as trials to improve equity for traditionally marginalized or disadvantaged populations. Additionally, future research would be more beneficial if service providers could

systematically collect more complete data on consumers who use AT-WAs. For example, practitioners could consider developing data capture protocols with built-in quality assurance mechanisms to collect and report AT-WA information more accurately. This would be particularly helpful in the case of individuals who identify with a racial/ethnic minority status, to help eliminate providers' errors resultant from failure to follow up on issues due to heavy caseload or discontinuity of services. Future research must explore these concepts in-depth through qualitative, quantitative, and mixed-methods investigations to better understand the gaps and intersections of AT-WA's service delivery.

Finally, it is worth taking a closer look at employment barriers reported by people with disabilities who have demonstrated an interest in AT-WAs because this group may be more likely to be employed if provided the requested AT-WAs. Many service providers have close connections with the disability community as well as communities of color to address such issues. They can use such linkages to become more engaged in exploring AT-WA usage for increased employment opportunities.

It is important to note that through advancement and technological development in AT-WAs, there is a need for continued educational opportunities (e.g., AT courses offered in accredited counseling programs, AT certificate programs, AT specialist mentors, AT-WA workshops/trainings/conferences, and state-federal funding). Such opportunities can help strengthen the future workforce in its ability to effectively serve culturally diverse persons with disabilities whose employment outcomes can be improved by AT-WAs. Similarly, minority-serving institutions (e.g., Historically Black Colleges and Universities) can provide promising laboratories for replicating and advancing this research to build a base of evidence that speaks to the bottom-line efficacy of the use of AT-WAs in enhancing employment outcomes of racial and ethnic minority populations of persons with disabilities. A stronger evidence base combined with more systematic and intentional knowledge translation strategies will go a long way to improve the standard practice of using AT-WA to bolster employment in underserved, underrepresented minority populations of individuals with disabilities.

Conclusion

This exploratory study represents a first step towards increasing the understanding of AT-WA usage and employment among people with disabilities from culturally diverse populations in the U.S., which is an essential but often neglected area by researchers, service providers, and public policy makers in the rehabilitation field (Grossman et al., 2020; Orellano-Colón, et al., 2018; & Ward-Sutton et al., 2020). Moreover, our findings support the importance of AT-WA usage contributing to successful employment outcomes and the lack of representation across various groups of persons of color with disabilities among those outcomes. Historically, this may be related to technology barriers (e.g., digital divide, racial and disability discrimination). While examining this study's unique and beginning contribution to this nascent, yet burgeoning literature can help us identify existing inequities, that are often influenced by a complex interplay of variables such as social determinants of health (e.g., low socioeconomic status, subpar educa-

tion, inadequate health literacy, diminished access to informational resources, high risk neighborhood effect) and the cultural values/identities endemic to these culturally diverse groups. Accordingly, assessing these existing inequities and social determinants can be useful predictors in the adherence of public policies (e.g., including consideration for future revisions to mandates) and practices. Many PoC could benefit from these implications noted for AT-WA services and supports not currently available to them. Without such help, consequently, they will not be able to succeed. Thus, our study and implications lay the groundwork for transformative change across the diversity development in the profession of rehabilitation research, policy, and practice.

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Community Living Outcome Factors for People of Color with Disabilities and Concomitant Opioid Use Disorder: A Scoping Review

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This scoping review mapped the pertinent extant published and grey literature and policy to assess factors that promote positive community living outcomes among people of color with disabilities and concomitant opioid use disorder (OUD) in the United States (U.S.). Forty-three publications covering OUD and people of color with disabilities and people of color with disabilities and community living content were reviewed. Select community living barriers and potential interventions were identified for people of color with disabilities in general; however, the review failed to classify such factors for those with OUD. Authors offered recommendations for practice, research, and policy.

Keywords: *Community living, disability, health disparities, opioid use disorder, people of color*

According to the United States (U.S.) Centers for Disease Control and Prevention ([CDC], 2019), 1 in 4 African Americans, 3 in 10 Native Americans and Alaskan Natives, 1 in 6 Latinx, 1 in 10 Asian Americans, and 1 in 6 Pacific Islanders have a disability. People of color with disabilities, unlike their White counterparts, are disproportionately marginalized and

do not feel empowered to make individual choices that support their community living aspirations. These inequities result from people of color with disabilities experiencing poor living conditions, discrimination, stereotyping, socioeconomic and environmental characteristics, segregation, at-risk housing, racism, and poor primary education (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020). Personal objectives among those who experience opioid use disorder (OUD) embody all aspects of their lives, which includes the right to self-determination in decisions about their homes and housing, work, education, health, transportation, leisure, and other activities of daily living (Administration for Community Living [ACL], 2019).

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Independent living denotes opportunities to work in the community, develop home living skills, navigate the community, and ensure self-care, safety, and personal health (Edemekong et al., 2017). To fully participate, one should have the opportunity to engage in shared activities and aspects of personal interest and maintain and expand social networks, friends, family members, and allies. Positive community participation outcomes (i.e., health, employment, transportation, housing, and education) are essential to people of color with disabilities and concomitant OUD, as these activities enable independent functioning in daily activities and community participation (American Occupational Therapy Association [AOTA] 2014; Quamar et al., 2020; Yee, 2011).

Opioid Crisis in the United States

The national opioid crisis has been declared a public health emergency in the U.S. (White House, 2017). Opioids include the illegal drug heroin, synthetic opioids such as fentanyl, a powerful synthetic opioid, and pain relievers available legally by prescription such as oxycodone (Oxycontin), hydrocodone (Vicodin), codeine, and morphine. The abuse of heroin, morphine, and prescription pain relievers is a severe global problem that affects the health, social, and economic welfare of all societies in the world (United Nations Office on Drug and Crime [UNODC], 2019).

According to the National Center for Health Statistics (NCHS), more than 47,000 Americans died in 2017 due to an opioid overdose, including prescription opioids, heroin, and illicitly manufactured fentanyl (NCHS, 2019). In that same year, about 1.7 million people were diagnosed with substance use disorders due to prescription opioid pain relievers, and 652,000 experienced a heroin use disorder (Center for Behavioral Health Statistics and Quality [CBHSQ], 2017). Available data suggest that roughly 21% to 29% of patients prescribed opioids for chronic pain misuse them, and between 8% and 12% develop an OUD (Vowles et al., 2015). Previous studies (i.e., Clark & Schumacher, 2017) have documented the link between prescription medication frequency use, especially opioids used to treat pain, sleep, and depression, with adverse health outcomes.

The Council of Economic Advisors ([CEA], 2019) reported that the epidemic cost \$696 billion in 2018; this represented 3.4% of gross domestic product (GDP) and more than \$2.5 trillion from 2015 to 2018. These massive costs point to the epidemic's negative national economic impact. In 2018, the U.S. Congress reached a bipartisan senate budget deal, which included \$6 billion for opioid addiction and mental health, including money for addiction treatment and prevention (Bipartisan Policy Center, 2019). The U.S. Department of Health and Human Services (HHS) has targeted these federal dollars to address the following five major priorities: (a) improving access to prevention, treatment, and recovery support services, (b) targeting the availability and distribution of overdose-reversing drugs, (c) strengthening public health data reporting and collection, (d), supporting cutting-edge research on addiction and pain, and (e) advancing the practice of pain management (HHS, 2018).

Race/Ethnicity Disparities in Healthcare Extend to Opioid Treatment

Disparities in healthcare services (i.e., substance use treat-

ment) in the U.S. are historical and contemporary and extend beyond provision and access for people of color (Smedley et al., 2003). These inequalities, largely based upon race/ethnicity, have influenced the public's perceptions of drug use and addiction. Specifically, these stereotypical perspectives were solidified mostly during the 1980s crack cocaine epidemic. During this period, the political campaign known as the "War on Drugs" was used to respond to the increasing rates of drug use and abuse in the country (Santaro & Santaro, 2018). Biased media representations of people in inner-cities frequently portrayed African Americans as addicts and criminals. In contrast, Whites were mostly characterized by the media as "victims" of drug use (Netherland & Hansen, 2018).

Although data about opioid use among persons of color with disabilities is relatively scarce, some information exists about members of these racially/ethnically diverse groups in general. For instance, studies document that Native Americans/Alaska Natives experienced the second-highest overdose rates from all opioids in 2017 (15.7 deaths/100,000 population) among racial/ethnic groups (CDC, 2019). This same group also had the second-highest overdose death rates from heroin (5.2%) and the third highest from synthetic opioids (6.5%) (Indian Health Services, 2018). In that same year (2017), 4.8% of Asian Americans and Pacific Islanders had a substance use disorder; and opioid overdose rates among Latinx increased by 52.5% between 2014 to 2016 (National Survey on Drug Use and Health [NSDUH], 2018). Latinx fatalities from opioid use increased by 52.5 percent in the same period compared to 45.8 percent for Whites, though statisticians note that counts for the former are typically underestimated by 3 to 5 percent (Katz & Goodnough, 2017). Opioid deaths among African Americans rose by 41% in 2016, while those for Whites increased by only 19% (Katz & Goodnough, 2017).

Purpose of the Scoping Review

This scoping review mapped the pertinent extant published and grey literature and policy over the last 25 years to increase the field's understanding of factors that promote positive community living outcomes among people of color with disabilities and concomitant opioid use disorder (OUD) in the U.S. To this end, the study addressed the following three objectives:

1. Conduct a systematic search of the published and grey literature along with policy for people of color with disabilities and concomitant OUD and associated community living factors,
2. Map out the characteristics, topics, and knowledge gaps across the scoping review,
3. Propose recommendations for advancing the community living research, policy, and practice for target population members.

Methods

The scoping review has become an increasingly popular approach for understanding the scope of literature in a topic area. It is a relatively new technique; therefore, a universal study definition or definitive procedure has not yet been established. It is similar to a systematic review in terms of search guidelines and writing style (Daudt et al., 2013; Davis et al., 2009; Levac et al., 2010), but tends to be much less rigorous. According to Arksey and O'Malley

(2005), the method seeks to present an overview of a potentially large and diverse body of literature pertaining to a broad topic and may have broader inclusion criteria. In contrast, a systematic review attempts to collate empirical evidence from a relatively smaller number of studies related to a focused research objective. Further, differing from systematic reviews that are conducted by groups following strict guidelines to summarize evidence (typically quantitative) on specific topics and new practices, the scoping review is conducted to discover types of evidence (i.e., literature) available in a given field and to investigate how research is being performed on a certain topic or field (Munn et al., 2018). Scoping reviews essentially determine the extent of and “scope” of extant literature. The scoping review procedure was applied in this current examination due to the literature’s newness, heterogeneity, and broad scale on this topic.

Design

Arksey and O’Malley (2005), proposed the following six stages for conducting a scoping review, which included (a) identifying the research objective/question, (b) identifying relevant studies, (c) study selection, (d) charting the data, (e) collating, summarizing and reporting results, and (f) consulting with experts. Given the extremely nascent attribute of this scoping review topic, we used a modified version of the Arksey/O’Malley framework. Essentially, we utilized stages (a) through (c) in their pure forms, as well as stage (d) (renaming it “charting literature found by the publication/study type), and (e) (summarizing the results of the types of literature found). We did not utilize the Arksey/O’Malley stage (f) (consulting with experts since we identified none on this topic and we did not have access to scoping review experts), although arguably we had eight research experts of convenience as the co-author team for this paper.

We searched and reviewed all documents relevant to study objectives over the last 25 years using Elton B. Stephens Company (EBSCO), disability journals, governmental documents (U.S. Census Bureau, Center for Behavioral Health Statistics, Substance Abuse and Mental Health Services Administration, National Center for Health Statistics), Blogs, Google Scholar, and ProQuest research library. At the outset, the ideal inclusion criteria required that the extant published and grey literature and policy covered the following themes simultaneously: (a) OUD, (b) people of color with disabilities, (c) health disparities, and (d) community living outcomes.

The research team grouped the publications into (a) government documents, (b) peer-reviewed papers, (c) organizational reports, and (d) blogs. This process helped the investigators catalog the sources of the literature needed in the scoping review. The scoping review search generated 547 publications whose content contained information about any combination of the criteria (i.e., one, two, three, or four of the key categories): OUD, people of color with disabilities, health disparities, and community living outcomes. The number of publications from each source was as follows: 547 total with 352 from EBSCO; 57 from ProQuest; 113 Google Scholar; 15 government documents; 10 blogs and books. Of all the literature generated, 417 articles were excluded because they were older than 25 years old, did not include clear community

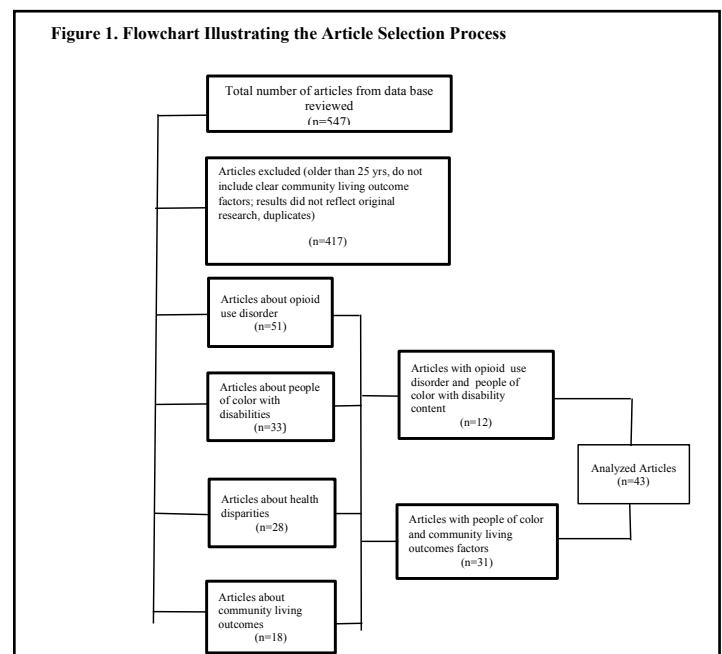
living outcome factors; results did not reflect original research, or were duplicates.

The remaining 130 publications were further grouped according to the four criteria (persons of color having a disability, having an OUD, health disparities, and community living outcomes). The classification resulted in publications about OUD (n = 51), people of color with disabilities (n = 33), health disparities (n = 28), and community living outcomes (n = 18).

These publications were further evaluated to identify those that were included in the final scoping review analysis. This examination was conducted by creating the following two different categories: (a) articles with OUD and people of color and disabilities (n=12) and (b) articles with people of color with disabilities and community living content (n=31). Figure 1 shows details about the process used to select publications across both areas. The review team, consisting of three primary co-authors, screened, grouped, and evaluated the publications independently during the entire scoping review process. In the case of disagreement between primary co-authors, two other co-authors were consulted until a consensus was reached.

Results

Although our scoping review identified select barriers and potential response strategies for people of color with disabilities pursuing positive community living outcomes, no relative information was found about those with disabilities and concomitant OUD. Since we did not find any information about those with OUD within the community living outcomes context, the results presented here are segregated across the following sub-areas; people of color with disabilities in general, OUD, and identified community living aspects. This scoping review included 43 total publications that examined the main themes in the study, which covered (a) OUD and people of color with disabilities content (n=12) and (b) people of color with disabilities and community living outcomes content (n=31). We found that of the documents selected, 18 (n=18)



were peer-reviewed articles, 15 (n=15) were policy briefs, and 10 (n=10) represented other sources that included blogs and books.

Regarding OUD and people of color with disabilities content, we found that 3 (n=3) publications discussed addiction and treatment; 2 (n=2) described the magnitude of OUD among African Americans; 1 (n=1) discussed opioid deaths by race and ethnicity; 3 (n=3) addressed OUD among Native Americans and Alaskan Natives, and 1 (n=1) described the impact of opioid use among Asian Americans and Pacific Islanders. Further, we found that 1 (n=1) publication addressed developments in the conceptualization and measurement of how acculturation leads to a greater understanding of culture’s role in the prevalence and treatment of substance-related problems. Finally, we identified only 1 (n=1) publication that addressed provider contributions to race-based disparities in pain management using opioids.

In our analysis of publications on community living factors for people of color with disabilities who have OUD content, we found that 9 (n=9) had content related to employment; 2 (n=2) discussed transportation challenges for people with disabilities; 5 (n=5) discussed general concepts of community living including housing; 12 (n=12) had content related to health as an outcome for community living; 2 (n=2) examined racial inequalities that are embedded in American popular and political cultures as well as in

medicine, and 1 (n=1) publication examined the post-high school/ educational outcomes of young adults with disabilities.

The study findings indicate that people of color with disabilities experience disparities across the community living outcome spectrum, and those with OUD face additional challenges that make their aspirational achievements in this context especially difficult. We reviewed the selected publications to summarize barriers and strategies that address community living outcomes for members of this target population.

Description of Publications about OUD and People of Color with Disabilities Content

To better understand OUD and people of color with disabilities, the research team established a matrix that looked at the publications’ objectives, targeted consumers, and publication type. Table 1 summarizes the objectives, targeted consumers, publication type/year/country, design and sample size if empirical - otherwise it is NA, and community living factor(s) addressed for each publication analyzed. The analysis addressed a wide variety of disabilities and OUD in the U.S. The research team reviewed journal articles, policy briefs, and blogs that addressed people of color and OUD. The documents included those about OUD and treatment and people of color in general (n=4), and others focused on African Americans (n=3), Native Americans and Alaskan Natives (n=3), Asian Americans (n=1), and Latinx (n=1) and OUD.

Table 1. Description of Articles about Opioid Use Disorder and People of Color with Disabilities Content

Article Author	Objective	Target	Publication Type/Year/ Country	Design/Sample Size (If Applicable)/ Community Living Factors
Addiction Center	To describe the relationship between disability and addiction.	Addiction and treatment professionals	Policy brief/ 2019/USA	Health
Alvarez et al.	To understand new developments in the conceptualization and measurement of how acculturation will lead to a greater understanding of culture’s role in the prevalence and treatment of substance-related problems.	The Latinx American population of the U.S	Journal article/ 2007/USA	Design=NA/ Sample Size=NA/ Health
American Psychiatric Association	To describe opioid use disorder and treatment.	Addiction and substance abuse counselors	Diagnostic manual/ 2013/USA	Health
American Treatment Centers	To understand the role of American Treatment Centers in addressing addiction among people of color.	Asian Americans	Policy brief/ 2020/USA	Health
Kaiser Family Foundation	To describe opioid deaths by race and ethnicity.	Policy, research, and practitioners in national health issues	Policy brief/ 2017/USA	Health
SAMHSA	To describe the magnitude of the opioid crisis among the African American population.	Policymakers, researchers, and practitioners in the field of opioid use disorder	Policy brief/ 2020/USA	Health
The Federal Health Program for American Indians and Alaskan Natives	To understand the opioid epidemic among American Indians and Alaskan Natives.	American Indians and Alaskan Natives	Policy brief/ 2018/USA	Health
Tipps et al.	To understand the magnitude of opioid use disorder among American Indians.	American Indians	Journal article/ 2018/USA	Design=NA/ Sample Size=NA/ Health
Sunrise House	To understand addiction among American Asians.	American Asians	Policy brief/ 2020/USA	Health
Wu & Blazer	To understand substance use disorder and co-morbidities among Asian American and Native Hawaiians /Pacific.	Asian American and Native Hawaiians /Pacific	Journal article/ 2015/USA	Correlational/ N=4572/ Health

This scoping review identified several knowledge, practice, research, and policy gaps in OUD and people of color with disabilities. Generally, a minimal body of evidence exists on this subject area. It is perhaps not surprising that documented evidence about OUD studies has been generalized and not focused on people of color with disabilities who experience this condition. Significantly, due to the emergence of the opioid crisis in the U.S., most of the reviewed documents described OUD as a problematic pattern of opioid use leading to issues or distress and treatment (American Psychiatric Association, 2013) or described opioid-related deaths by race and ethnicity (Kaiser Family Foundation, 2017). Further, the review indicated that there is sufficient evidence that provider behavior contributes to race-based disparities in pain treatment that warrant further study. Notably, the examination also revealed that both the magnitude of racial and ethnic differences and the reasons behind such disparities are likely to vary by location, ethnic group, and the type of outcome measure studied (Burgess et al., 2006).

Regarding people of color with disabilities and concomitant OUD, this review identified limited literature that explicitly addressed this target population (i.e., people of color with disabilities who concurrently experience OUD). The publications mainly focused on the relationship between disability, disparities in treatment, and addiction rather than specifically on people of color with disabilities who additionally experience OUD. One publication used the findings to support the notion that persons with disabilities are substantially more likely to suffer from substance use disorders than individuals in the general population, and they are also less likely to receive treatment (Addiction Center,

2019). Conversely, according to the article, persons with addictions are more likely to acquire a subsequent disability, either through accidental injury or through long-term side effects of substance abuse (Addiction Center, 2019).

Another publication discussed treatment centers' role in addressing addiction among Asian Americans while excluding the disability context. According to the publication, although generalized national data reflect lower rates of substance abuse among Asian Americans, this should not imply that the impact of addiction on this community is negligent. There is a concerning disparity between Asian Americans and the rest of the population about the rate of individuals receiving substance abuse treatment (American Treatment Centers, 2020).

A policy brief that described the magnitude of the opioid crisis among African Americans provided recent data on the prevalence of opioid misuse and opioid overdose death rates in the African-American population in the U.S. (SAMHSA, 2020). This brief also discussed contextual factors that impact the opioid epidemic in these communities. Such factors included barriers to accessing early intervention and treatment; innovative outreach and engagement strategies that have the potential to connect individuals with evidence-based prevention and traditional treatment. Also discussed was recovery as well as the importance of ongoing community voices and leadership in the development and implementation of solutions to this public health crisis.

Another publication that addressed the issue of opioid use among Native Americans and Alaskan Natives stated that both groups had the second-highest rate of opioid overdose of all U.S. racial and ethnic groups in 2017, along with the second and third highest overdose death rates from heroin and synthetic opioids, respectively (Indian Health Services, 2018). Regarding Asian Americans and Native Hawaiians/Pacific Islanders, a publication stated that although small sample sizes limit available data, there is a need to separate Asian Americans and Native Hawaiians/Pacific Islanders in health statistics and increase research into substance use and treatment needs for these fast-growing but understudied population groups (Wu & Blazer, 2015). Table 2 presents the details of the analysis of publications about community living outcomes for people of color with disabilities.

Community living for people of color with disabilities and OUD encompasses facets of livelihood that includes work, education, health, transportation, leisure, and activities of daily living. The review looked at publications that addressed each of these constructs. We found 31(n=31) publications with content related to community living outcomes for people of color with disabilities. Our critique revealed that 15 (n=15) were journal articles, 5 (n=5) government reports, 6 (n=6) policy briefs, 2 (n=2) books, 2 (n=2) news items, and 1 (n=1) a blog. Due to the large number of documents, we looked at the main themes, which were employment (n=9), transportation (n=3), housing (n=3), health (n=14), and education (n=2). It is important to note that stereotyping and stigma were also identified in the literature as important community living factors.

Table 2. Description of Articles with People of Color with Disabilities and Community Living Content

Article Author	Objective	Target	Publication Type/Year/Country	Design/Sample Size (If Applicable)/Community Living Factors
Administration for Community Living	To describe how the federal government advocates for the rights of the aged and people with disabilities.	Federal, State, and research institutions	Policy guidelines/ 2019/USA	Employment, Housing, Health
Alfraifi	To describe strategies used to advance economic security for people with disabilities.	Policy makers	Policy brief/ 2019/USA	Employment
Artiga et al.	To understand the economic and health challenges facing people of color during COVID-19 pandemic.	Policy makers, Federal, State, and research institutions	Issue brief/ 2020/USA	Employment, Health
Bascom & Christensen	To understand individuals with disabilities' transportation opportunities and constraints were examined in connection with their social networks.	Researchers, policy makers, and professionals working with people with disabilities	Journal article/ 2017/USA	Correlational/ N=420/ Transportation
Carroll et al. CDC/MMWR	To describe the relationship between disability and physical activity.	Policy makers, researchers, primary care providers	Issue brief/ 2014/USA	Health
Center for Disease Control and Prevention	To describe how the federal government, researchers, and public health practitioners address issues affecting adults with disabilities.	Researchers, public health practitioners, and persons interested in the wellbeing of adults with disabilities	Policy brief/ 2019/USA	Employment Health
Center for Talent Innovation	To describe disability and inclusion in employment.	Researchers, department of labor, employers, primary care providers	Research findings and policy recommendations/ 2017/USA	Employment, Education
Courtney et al.	To understand the association of functional disability type and smoking among adults aged 18-49 years.	Researchers, policy makers, and primary health providers	Journal article/ 2014/USA	Correlational/ N=40,753/ Health
DeFulio et al.	To understand employment-based reinforcement in unemployed opioid-dependent adults.	Researchers, policy makers, primary care providers	Journal article/ 2012/USA	Experimental/ N=35/ Health, Employment
Dunigan et al.	To understand the engagement in outpatient substance abuse treatment and employment outcomes.	Primary health providers, researchers, and policy makers	Journal article/ 2014/USA	Correlational/ N=8,536/ Health, Employment
Edwards et al.	To understand racial/ethnic disparities in the utilization of health care services and the impact of patient-perceived cultural barriers on medical care utilization.	Policy makers, primary care providers, researchers	Book/ 2010/USA	Education, Health
Fan et al.	To understand psychological distress, rehabilitation services, and disability status among noninstitutionalized U.S. adults aged 35 years and older.	Primary care providers, Vocational & Rehabilitation counselors	Journal article/ 2009/USA	Correlational/ N=177,663/ Health, Housing
Frieden	To understand access to transportation by people with disabilities.	Policy makers, federal, state, and community service providers	Monograph/ 2005/USA	Transportation
Goode et al.	To understand the need for collaborative health disparities research on race/ethnicity and disability.	Researchers, policy makers	Journal article/ 2014/USA	Design=NA/ Sample Size=NA/ Health, Education, Employment

The review also examined publications that address various factors (i.e., employment, health, education, transportation, and housing) that impact community living outcomes among people of color with disabilities.

Employment

Our review found ten publications that discussed employment for people with disabilities. According to Altiraifi (2019), to advance economic security for people with disabilities, policymakers must level the playing field for disabled workers while also guaranteeing access to housing, nutrition, and healthcare for those unable to work. Specifically, people of color with disabilities are more likely to be jobless, work part-time, or be self-employed than those without disabilities (Ohikuare, 2018). Additionally, the manifestation of the exclusion of people of color with disabilities is experienced in the underestimation of their intelligence, misjudged insults, and avoidance of work (Center for Talent Innovation, 2017). Further, there are considerable socioeconomic disparities between working-age adults of color with disabilities and those without a disability (Stevens et al., 2016).

Benefits derived from employment include improvements in overall quality of life, increased treatment completion, and sustained recovery, and are inherent assets for competitive employment (Dunigan et al., 2014). There are also several secondary benefits of employment, including increased self-esteem, healthy personal and social relationships, enhanced social integration and connection, and improved symptom control (Dunigan et al., 2014; Laudet, 2011; Pasareanu et al., 2015; SAMHSA, 2018). Employment has also been shown to improve the stability, health, and social well-being of people of color with disabilities. In particular, engagement in activities of daily living after substance use treatment is an important outcome but is often difficult to accomplish (Dunigan et al., 2014). According to the National Council on Alcoholism and Drug Dependence (NCADD), employers may also be hesitant to hire someone with a history of substance use disorder because of the high risk of premature death or fatal accidents, the increased possibilities of injuries and accidents, absenteeism and/or excessive use of sick leave and the loss of production (NCADD, 2015).

Disparities in Health

Health disparities are defined as population-specific differences in the presence of disease, health outcomes, or access to health

Article Author	Objective	Target	Publication Type/Year/Country	Design/Sample Size (If Applicable)/Community Living Factors
Hansen	To identify sociocultural factors that impact access to Medical Assistance Treatment and care for people with disabilities.	Researchers, policymakers	Journal article/ 2017/USA	Transportation
Hansen et al.	To understand the treatment for opioid dependence by income, ethnicity, and race.	Researchers, V.R. counselors, primary care providers	Journal article/ 2016/USA	Correlational/ N=179/ Health, Employment
Heasley	To identify transport hurdles that keep people with disabilities homebound.	Primary care providers, home care providers, researchers	Blog/ 2012/USA	Transportation
Indian Health Services	To understand the impact of opioid use disorder among the American Natives.	Federal, state, researchers, primary care providers, community institutions	Policy guidelines/ 2018/USA	Health
James, K & Jordan A.	To understand racial inequalities that are embedded in American popular and political cultures as well as in medicine.	Federal and state governments	Journal article/ 2018/USA	Design=NA/ Sample Size=NA/ Health, Employment, Housing
Kawachi et al.	To identify historical, political, and ideological obstacles that have hindered race and class analysis as codeterminants of health disparities.	Researchers, policymakers	Journal article/ 2005/USA	Design=NA/ Sample Size=NA/ Health, Education
Katz, J. & Goodnough	To understand which opioid use disorder is	General public	News Item/ 2017/USA	Health
Kesler Foundation	To explore the experiences of Americans with disabilities in finding and maintaining employment.	Policymakers, researchers, public health providers	Report on findings of a national survey/ 2015/USA	Employment, Transportation
Kidorf et al.	To understand the association of improved treatment outcomes and employment for people with an opioid use disorder.	Researchers, policymakers, public health providers	Journal article/ 2004/USA	Correlational/ N=228/ Health and Employment
Lippold et al.	To understand the overdose-related death rates among blacks aged 45-54 years in large metro areas.	Policymakers, researchers	Mortality and morbidity weekly report/ 2019/USA	Health
Mossey	To understand racial and ethnic disparities in pain management.	Researchers, policymakers	Journal article/ 2011/USA	Correlational/ N=269,269/ Health
National Council on Disability	To explore the home and community-based services for success at home, at work, and in the community for people with disabilities.	Policymakers	Policy brief/ 2015/USA	Housing, Employment
National Institute on Disability, Independent Living and Rehabilitation Research	To understand the NIDILRR's 2018-2023 Long-Range Plan (the plan)	Federal, state researchers, primary care providers, and communities	Long-Range Plan/ 2018/USA	Health, Housing, Transportation, Education, Health
Ohikuare	To explore the visible and invisible challenges that workers with disabilities face.	Policymakers, researchers, public health providers	Blog/ 2018/USA	Employment
Orgera & Artiga	To understand disparities in healthcare	Policymakers, researchers, primary health providers	Issue brief/ 2018/USA	Health

Article Author	Objective	Target	Publication Type/Year/Country	Design/Sample Size (If Applicable)/Community Living Factors
Sanford et al.	To understand the post-high school outcomes of young adults with disabilities	Policymakers, researchers, educators	Policy brief/ 2011/USA	Education, Health
Santaro & Santaro	To understand the history of systemic bias and implications for care.	Policymakers, researchers	Journal article/ 2018/USA	Design=NA/ Sample Size=NA/ Health, Employment, Housing
Schalock & Alonso	To understand the quality of life for human services providers.	Human services providers, researchers, policymakers	Handbook/ 2002/USA	Employment, Housing

care (Perez-Escamilla, 2011). Health is not just living a longer life; it is about a happier, healthier, and better life. The word “health” refers to a state of complete emotional and physical well-being (World Health Organization [WHO], 2018). Good health factors include genetics, the environment, relationships, and education (WHO, 2018). The WHO describes barriers as being more than just physical obstacles. It includes environmental factors that may limit functioning, create disability, and could consist of the following: (a) a physical environment that is not accessible; (b) lack of relevant assistive technology (assistive, adaptive, and rehabilitative devices); (c) people’s negative attitudes toward disability; and (d) services, systems, and policies that are either nonexistent or hinder the involvement of all people with a health condition in all areas of life (WHO, 2018).

Education

According to the United Nations Educational Scientific and Cultural Organization (UNESCO) Institute for Statistics (2017), people of color with disabilities are more likely to be out of school or leave school before completing elementary or high school education. Education is also essential to improving awareness of the need for accessibility and understanding of their communities. This suggests that since the general population of people with disabilities faces the above challenges, people of color with disabilities likely face even more significant challenges that arise from systemic discrimination and stigma associated with disability and racial backgrounds.

Transportation

Transportation accessibility has been identified as one of the primary strategies to address people of color with disabilities’ independence and self-determination in society (Frieden, 2005; Wehmeyer et al., 1996). Understanding the role of transportation access in the social exclusion of people of color with disabilities is necessary to assure the full participation of people of color with disabilities in all aspects of society (Yigitcanlar et al., 2012). Access to transportation by people of color with disabilities is essential in obtaining employment, education, healthcare, and social interaction. This means that for people of color with disabilities to enjoy quality community living, accessible, affordable, and available transportation systems must be in place (Bascom & Christensen, 2017).

While the Americans with Disabilities Act (ADA) in 1990 increased nationwide physical accessibility of public transportation for people with disabilities in the U.S., and despite removing many physical barriers within fixed-route systems, significant barriers to overall access to public transportation systems are still widespread (Bascom & Christensen, 2017). In the current automobile-dependent society, people of color with disabilities face fewer opportunities to interact with their communities.

Housing

The U.S. housing system is characterized by high housing costs, minimal Social Security Insurance (SSI) and Social Security Disability Insurance (SSDI) support, and inadequate resources to provide housing assistance to people of color with disabilities (Altraifi, 2019). Creating and sustaining safe, accessible, affordable, and integrated housing poses challenging and complex barriers to

people of color with disabilities (Altraifi, 2019). These barriers come from the interaction of poverty, inaccessibility, and current funding rules related to acquiring supportive services, as well as poor disability policy (Altraifi, 2019).

This system is rooted in the outdated practice of segregating people of color with disabilities from the mainstream community through institutionalization (National Council on Disability [NCD], 2010). Typically, poverty and the low-income status of persons of color with disabilities are key barriers to acquiring housing. Considering that poverty is much higher in the general population of individuals with a disability, i.e., among people ages 25 to 64 with severe disabilities (27%) when compared to people in the same age group with non-severe disabilities (12%) and no disability (9%). For many, this is due to being unemployed (NCD, 2010). In 2005, less than half (46%) of the population with a disability ages 21 to 64 was employed; hence, housing is not affordable (NCD, 2010).

Discussion

The three specific objectives of this scoping review were to (a) conduct a systematic search of the published and grey literature along with policy for people of color with disabilities and concomitant OUD and associated community living factors, (b) map out the characteristics, topics, and knowledge gaps across the scoping review, and (c) propose recommendations for advancing the community living research, policy, and practice. To address these objectives, we synthesized a total of 12 documents that discussed OUD and people of color and 31 on community living factors for people with disabilities; identified knowledge gaps in the available data; and will discuss next in this discussion section a set of strategies for consideration across the challenges organized across the following key thematic areas: (a) employment, (b) transportation, (c) housing, (d) health disparities, (e) educational factors, (f) and stigma.

Employment

Our review revealed that employment improves overall stability, health, and social well-being and that people of color with disabilities disproportionately achieve this community living outcome compared to Whites. Further, the current critique denoted that both unemployment or underemployment statuses are related to their lower-wage attainment and sub-standard living conditions to include poverty. To address barriers that contribute to high levels of unemployment among people of color with disabilities and concomitant OUD, our study suggests that rehabilitation professionals working with target population members should make more significant efforts to a) identify change processes for unconscious bias, b) help the leadership and indeed all employees at the employment site better understand the challenges that persons of color with disabilities with concomitant OUD face in the addictions and employment arenas and how to contribute to solutions, and c) strengthen the hiring pipeline in doing job development by continually engaging with community groups. Unconscious bias among professionals can lead to unfair decisions and consequent unequal outcomes (Hall et al., 2015). Thus, an enhanced understanding of how this mindset can be manipulated is warranted to ensure improved services leading to additional positive employment outcomes.

Moreover, employers sometimes lack knowledge about addictions and how to support persons recovering from substance dependency (Addiction Center 2019, Society for Human Resource Management [SHRM], 2018). There may be a need to provide a training regime emphasizing strategies for supporting such persons within their employment settings. Job development activities may also need to be reimagined at both the pre-service and in-service levels to more flexibly include the unique challenges of this target population. Academic rehabilitation counseling programs might consider placing greater emphasis on developing high-quality jobs for target population members in supportive job environments. Current practicing professionals should be aware of the importance of broadening their job development targets and expanding resources specific to this service population.

Transportation

Our review identified access to transportation as a challenge that people of color with disabilities and concomitant OUD face in achieving full community participation. This barrier impedes them from maintaining good health status and ultimately impacts their employment prospects, a key community living outcome (Bascom & Christensen, 2017; Bezyak et al., 2017). The study also found those with OUD living in rural communities face even greater barriers to accessible transportation (Henning-Smith et al., 2017).

According to our review, various public policy initiatives address transportation barriers for people of color with disabilities who also experience OUD. Section 504 of the Rehabilitation Act of 1973 (commonly referred to as 29 U.S.C. 794) prohibits discrimination based on disability in any programs receiving federal funds. Recipients of federal aid and state and local entities responsible for roadways and pedestrian facilities must ensure equal access for people with disabilities, especially those of color and with OUD, to roads and sidewalks, rest areas, pedestrian overpasses, and underpasses.

There may be a need to audit these policies to increase their relevance with the current needs of target population members residing in urban and rural communities. Our review identified the need for customized paratransit services that include advanced reservations and curb-to-curb services for target group members unable to use options such as Suburban Mobility Authority for Regional Transportation (SMART) Fixed Route bus services. Other identified strategies include more training in disability sensitivity and passenger assistance techniques and developing and applying emerging technology and service models to all public transportation interventions.

Housing

According to the review, poor-quality housing is associated with various adverse health outcomes, including chronic disease and injury and poor mental health. Due to their disability status and experiences with OUD, people of color with disabilities are far more likely to live in sub-standard housing, and the social and physical environments as well as the communities in which their homes are situated may also be impoverished. The analysis identified the Americans with Disabilities Act (ADA), Section 504 of the Rehabilitation Act of 1973, and standards from the Department of Urban Development as initiatives pertinent for improving hous-

ing among target population members. Section 504 of the Rehabilitation Act of 1973 is a federal law that prohibits discrimination based on disability in federally assisted programs or activities. It also prohibits discrimination based on disability in programs or activities that receive federal financial assistance from the U.S. Department of Education. Title II of the ADA prohibits discrimination based on disability by state and local governments. The Fair Housing Act prohibits municipalities and other local government entities from making zoning or land use decisions or implementing land-use policies that exclude or otherwise discriminate against individuals with disabilities. According to our review, the following strategies were recommended to potentially address the lack of and low quality of housing for people of color with disabilities who experience OUD: a) enhance the Low-Income Housing Tax Credit, which represents a dollar-for-dollar tax credit in the U.S. for affordable housing investments, b) advocacy to improve affordability and accessibility in housing, c) advocacy for more community-based housing programs, and d) expand the housing choice voucher. The Housing Choice Voucher program is the federal government's significant effort to assist very low-income families, the elderly, and the disabled to afford decent, safe, and sanitary housing in the private market.

Health Disparities

Our study found that health disparities take on many forms among people of color in the U.S., including premature death compared to Whites' rates and higher rates of chronic diseases. The review indicated that these inequities result from ethnic and racial groups experiencing poor living conditions, discrimination, stereotyping, socioeconomic and environmental characteristics, segregation, at-risk housing, racism, and poor primary education. Patient-driven contributors consider income, insurance coverage, medical settings, timeliness of care received, where care is received, and patient adherence to treatment plans. Also identified were provider contributors such as lack of cultural competency, negative stereotyping influencing clinical decision-making, racial and ethnic bias, and counterproductive physician practice styles. The review found that health disparities result from the difficulties racial and ethnic groups encounter when entering a seemingly fragmented and biased healthcare delivery system.

Several explanations were proffered through our review of how public health, medical care, and health service providers influence health disparities. These inequities occur when providers intentionally or unintentionally convey lower expectations for patients categorized as underprivileged due to race and ethnicity, income, education, class, gender, or religion. To address them, this review recommended a) increasing the availability, quality, and use of data to improve the health of people of color with disabilities and co-occurring OUD, b) measuring and providing incentives for better healthcare quality, and c) monitoring and evaluating the U.S. Department of Health and Human Services' (HHS) Disparities Action Plan and its impact on target population members.

Education and Availability of Opioids in Communities

The quality of community living outcomes for people of color with disabilities and concomitant OUD is greatly influenced by the availability of opioids, misperceptions, and faulty explanations about addiction and these drugs. Increased accessibility is

attributed to the low prices of opioids, which has exponentially expanded uptake by people of color with disabilities who use opioids as self-medication, ultimately leading to overuse and addiction (Mueller et al., 2015). This increase is partially attributed to the rapid availability of illicitly made fentanyl and other highly potent synthetic opioids.

Current strategies for addressing this proliferation include (a) prescription drug monitoring programs (PDMPs) across multiple states to help track the prescribing and dispensing of substances, (b) implementation of systems to alert surrounding pharmacies in the area when fraudulent prescriptions have been identified. In addition to these, our review suggested that prescription drug manufacturers research and develop abuse-deterrent formulations (ADFs) that aim to avert consumers from misusing medications via injection or snorting; and band together communities to create a full continuum of prevention, early intervention, treatment, and recovery support services, with all areas or communities having a voice through their elected representatives as to where such resources are located.

Education and Fear of Legal Consequences

The criminalization of opioid use among people of color and the enactment of laws like the Anti-Drug Abuse Act of 1986, enforced across the country, resulted in mandatory and severe sentencing for low-level, nonviolent drug offenses, particularly related to cocaine, for a disproportionately high number of people of color compared to Whites. This criminalization has created significant historical mistrust of healthcare, social services, and the justice system, more so among people of color with disabilities (SAMHSA, 2020). There is fear among people of color with disabilities and concomitant OUD that seeking treatment will result in severe sentencing and incarceration and losing children to the foster care system (SAMHSA, 2020).

Some community-based organizations and counties partner with local law enforcement to create programs where community members can have social interactions like having coffee with police officers and talking about issues and community concerns without fear of being arrested. Since the fear of legal consequences prevents people of color with disabilities with co-occurring OUD to seek treatment (SAMHSA, 2020), there is a need for: a) local community leaders and faith-based organizations to reach out more frequently to target group members to create awareness about the importance of seeking treatment, b) train service providers to advocate for those who voluntarily seek treatment and c) implementing more strategies to build trust between the community and law enforcement.

Stigma

People of color with disabilities and concomitant OUD often experience stigma due to their disability status and drug use. Stigma involves the processes of labeling, stereotyping, social rejection, exclusion, as well as the internalization of community attitudes in the form of shame by the person or family being discredited (SAMHSA, 2020). These perceptions are due to inadequate knowledge about disability within minority and substance-dependent contexts. The social stigma attached to certain patterns of psychoactive drug use has a long history in the U.S. and is inseparable

from cultural strain related to issues such as race, religion, social class, gender roles, and intergenerational conflict (CDC, 2019). Culturally responsive service deficits have also contributed to the stigma associated with people of color who experience OUD.

Our review denotes that stigma attached to OUD constitutes a significant obstacle to personal and family recovery, contributes to the marginalization of addiction professionals and their organizations, and limits the type and magnitude of cultural resources allocated to OUD related problems. OUD addiction, treatment, and recovery-related stigma manifest in a broad range of attitudes, behaviors, and policies that range from social shunning to discrimination in such areas as access to medical, dental services, governmental benefits, training, or employment opportunities as well as housing and homelessness services.

There needs to be a broad and diverse network of partners and community-based organizations to improve awareness in the affected communities. Strategies that might address stigma vary by the extent to which OUD implicates target population members and includes: (a) increasing culturally relevant public awareness about OUD among people of color with disabilities, (b) implementation of comprehensive, holistic approaches, and c) creation of a culturally appropriate and diverse substance dependence and rehabilitation workforce.

Limitations

All research has limitations, and this scoping review is no different. A limitation of the study is that it does not include the voices of target population members, i.e., people of color with disabilities and concomitant OUD, which would be impractical to include as a scoping review, especially to locate sufficient numbers of respondents. Second, this inquiry explored the perspectives of providers rather than people of color with disabilities and concomitant OUD. This limitation might have restricted the richness of the new information gleaned from target group member perspectives. Finally, this scoping review analyzed the extant published and grey literature and policy documents in the past 25 years related to community living factors for people of color with disabilities and concomitant OUD. However, due to the literature's newness, heterogeneity, and broad scale on this topic, there is a possibility that all relevant documents and/or community living factors were not identified.

Conclusion

This scoping review is the first of its kind, timely, and an important investigation indicating people of color with disabilities and concomitant OUD experience disparities across the community living outcome spectrum. The characterization and identification of the gaps in the review would play a crucial role in informing strategies and developing policies to mitigate racial discrimination, social exclusion, and stigma for people of color with disabilities and concomitant OUD. Although select community living barriers interventions and potential response strategies were identified for people of color with disabilities, the review failed to classify such factors for those with OUD, the target population. This is probably due to the newness of research to date on persons with OUD, especially persons of color with co-occurring other dis-

abilities. Also, the addition of yet another dimension of community living outcomes, further limited the supply of literature on this original topic, perhaps rendering it too narrow and specialized for the evolution of the science to date. Bear in mind that the unfortunate growing crisis of OUD and its impact on such criteria, will likely mean that over time there will be more extant literature on the original topic of this scoping review. Therefore, we must revisit this examination a bit later because such research findings, when in adequate dose, will inform further research, policy, and practice.

To address community living outcomes for people of color with disabilities and concomitant OUD, key players must understand that they have a right to engage in independent living activities fully and in the least restrictive environment. Such events include their ability to live in communities of their choice; participate in meaningful community activities based on personal interests; have relationships with friends, interact with the family where one chooses; work and earn a living wage; be physically and emotionally healthy; have opportunities to learn, grow and make informed choices; and carry out responsibilities of citizenship such as paying taxes and voting. Community context and systems in which these activities occur also contribute to OUD and influence community living outcomes. For example, our findings showed limited literature about any studies undertaken on Latinx populations with disabilities with OUD.

Further, the analysis revealed that while policy briefs on people of color with disabilities and concomitant OUD are available, most of them are generalized disability studies that lack literature focused on this population. There was also a minimal description in the literature to identify the fundamental principles for developing community-oriented opioid-related plans, such as social justice, health equality, and cultural safety. Therefore, this review suggests that there is a continually growing need for further research to understand community living outcome barriers, interventions, and culturally appropriate response strategies for people of color with disabilities experiencing concomitant OUD.

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Barriers and Translational Solutions to Improving Community Living Outcomes among People of Color with Disabilities with Opioid Use Disorder: A Focus Group Perspective

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This investigation examined vocational rehabilitation, substance abuse, and mental health service providers' perceptions about barriers and potentially translational solutions to poor community living outcomes for people of color with disabilities (i.e., African Americans, Latinx, Native Americans and Alaskan Natives, Asian Americans, and Pacific Islanders) who have opioid use disorder. We conducted one focus group discussion (N = 12) that identified the proliferation of opioids in the community, treatment access, employment, and transportation as community living outcome barriers. The findings point to the need for further research that address poor outcomes among target group members.

Keywords: *People of color, opioid use disorder, disability, community living*

The opioid crisis has been declared a public health emergency in the United States (U.S.) (White House, 2017). In 2017, an estimated 1.7 million Americans experienced substance use disorders related to prescription opioid pain relievers, and 652,000 had a heroin use disorder (Center for Behavioral Health Statistics and Quality [CBHSQ], 2017). Opioids are a class of drugs that include the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription

such as oxycodone (OxyContin), hydrocodone (Vicodin), codeine, and morphine. Prescription drug misuse, which include opioids, is among the fastest-growing drug problems in the U.S. (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). In 2016, for example, 3.6 percent of adolescents between the ages of 12 to 17 reported misusing them over the past year. This percentage was almost twice as high among older adolescents and young adults ages 18 to 25. An estimated 4 to 6 percent of individuals who misuse prescription opioids transition to heroin, and approximately 80 percent started with heroin (Carlson et al., 2016). Of those who began abusing opioids in the 2000s, 75% reported that their first opioid was a prescription drug (Cicero et al., 2014).

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Opioid agents bind to opioid receptors found in the central nervous system and gastrointestinal tract and once attached they send signals to the brain of the “opioid effect,” which blocks pain, slows breathing, and has a general calming and anti-depressing effect (National Alliance of Advocates for Buprenorphine Treatment [NAABT], 2016). They are used mostly to treat moderate to severe pain, though they can be used to treat coughing and diarrhea. Due to pain sometimes associated with disability and their use to treat pain, disability and opioid use disorder can be tragic (Krause et al., 2018; Washington-Walker et al., 2017). Native Americans and Alaska Natives experienced the second-highest overdose rates from all opioids in 2017 (15.7 deaths/100,000 population) among racial/ethnic groups (U.S. Centers for Disease Control and Prevention [CDC], 2019). This same group also had the second-highest overdose death rates from heroin (5.2%) and third highest from synthetic opioids (6.5%) (Indian Health Services, 2018). In that same year (2017), 4.8% of Asian Americans and Pacific Islanders had a substance use disorder; and opioid overdose rates among Latinx increased by 52.5% between 2014 to 2016 (SAMHSA, 2019). Latinx fatalities from opioid use increased by 52.5 percent in the same period compared to 45.8 percent for Whites, though statisticians note that counts for the former are typically underestimated by 3 to 5 percent (Katz & Goodnough, 2017). Opioid deaths among African Americans rose by 41% in 2016, while those for Whites increased by only 19% (Katz & Goodnough, 2017). According to the CDC (2019) 1 in 4 African Americans, 1 in 10 Latinx, 3 in 10 Native Americans/Alaskan Natives, 1 in 6 Asian Americans and Native Hawaiians/Pacific Islanders have a disability. These individuals are substantially more likely to suffer from opioid use disorder than the general population and also less likely to receive treatment (Murray, 2018).

Disparities in healthcare services (i.e., substance use treatment) are historical and extends beyond provision and access for people of color (Institute of Medicine, 2003). These inequalities, largely based upon race/ethnicity have influenced the public’s perceptions of drug use and addiction. Specifically, these stereotypical perspectives were solidified mostly during the 1980s crack cocaine epidemic. During this period, the political campaign known as the “War on Drugs” was used to respond to the increasing rates of drug use and abuse in the country (Santaro & Santaro, 2018). Biased media representations of people in inner-cities frequently portrayed African Americans as addicts and criminals. In contrast, Whites were mostly characterized by the media as “victims” of drug use (Netherland & Hansen, 2018).

Community living aspirations for people of color with disabilities who have opioid use disorder encompasses all aspects of their lives, which includes, but is not limited to the right to self-determination in decisions about their homes and housing, work, education, health, transportation, leisure, and other activities of daily living (Administration for Community Living [ACL], 2019). Such activities denote opportunities to work in the community, develop skills related to home living, navigate the community, ensure self-care, safety, and personal health (ACL, 2019). Community living means participating in community activities, aspects of personal interest, and maintaining as well as expanding social networks, friends, family members, and allies. Community living outcomes (i.e., health, employment, transportation, housing, and education)

are essential to people of color with disabilities and their families and offer many benefits to the communities themselves (ACL, 2019).

Persons of color with disabilities who experience opioid use disorder can face barriers that hinder or complicate their goal of leading a productive life in the community of one’s choosing. Such barriers include physical environments that are not accessible, lack of relevant assistive technology (assistive, adaptive, and rehabilitative devices), negative attitudes of people towards disability, along with services, systems, and policies that are either nonexistent or that hinder their involvement in all areas of life (Houtenville & Boege, 2019). While some may require little or no assistance to achieve this goal, others require a complex array of services and supports to facilitate social inclusion and participation (National Institute on Disability, Independent Living, and Rehabilitation Research [NIDILRR], 2018). Although a plethora of data exists on community participation challenges experienced by people with disabilities in general, relatively little knowledge exists about factors that impede and promote positive outcomes among those from communities of color experiencing opioid use disorder. The purpose of this study was to examine perceptions about barriers and solutions that could lead to successful community living outcomes for individuals from this target population. The following research questions were addressed:

1. What are the service providers’ perceptions of the barriers to positive community living outcomes for people of color with disabilities who have opioid use disorder?
2. What are the service providers’ perceptions of the solutions to improve community living outcomes for people of color who have opioid use disorder?

Method

This qualitative study used a focus group discussion (FGD) to understand vocational rehabilitation, substance abuse, and mental health service providers’ (i.e., counselors, clinicians, directors) perceptions about the barriers and solutions to improving community living outcomes among people of color with disabilities who have opioid use disorder. Qualitative methods in health and disability are being increasingly used in research and have generated pertinent new knowledge (Aref et al., 2017). The importance of using FGD includes revealing, clarifying and testing preconceived notions and findings, uncovering ideas and issues that initially may not have been considered but are important to the participants, and having the flexibility to dive deeper into issues that come up during the discussion (Mishra, 2016).

Participants

Purposive sampling was used to select FGD participants (Etikan et al., 2016). This technique represents a nonprobability strategy that researchers use to choose a cohort of study participants based upon pre-identified desired characteristics (Sharma, 2017). Advantages of this approach is that it is commonly used, less expensive, and there is no need for a list of all the population elements (Acharya et al., 2013).

Cohort of Participants

The focus group cohort (N=12) was drawn from a developed pool of vocational rehabilitation, substance abuse, and mental health service providers (e.g., counselors, clinicians) from four different agencies in the state of Oklahoma that provide outpatient or inpatient services to persons of color with opioid use disorder. Focus group participants met the following inclusion criteria: (a) must be working at an organization/agency that provides vocational rehabilitation, mental health, or substance abuse treatment services, and (b) must be at least 18 years of age. Participation was voluntary and participants could withdraw at any time. They signed a consent form preceding the FGD.

Profile of Participants

The racial/ethnic description of the study sample included 7 African Americans (50%), 4 Native Americans (28.57%), and 1 White (7.14%). In terms of gender, 3 of the participants were male (21.42) and 9 females (64.28%). See Table 1 for other details on participants' characteristics.

Procedures

The study procedures were approved by the Institutional Review Board (IRB) at Langston University. The research team provided information to participants about the study's purpose, confidentiality, and benefits before starting the FGD. The investigators developed the research questions and protocol to elicit participants' perceptions about opioid use disorder, barriers that impede and strategies that promote positive community living outcomes among members of the target population. The discussion was led by two lead investigators. Three researchers also served as observers and note-takers while one other researcher served as the recorder. In conjunction with the FGD transcripts, the observer notes, and memos provided supplementary information on FGD

dynamics. Verbatim transcripts of audiotapes, observer notes, and the application of the demographic data responses were the primary data for analysis.

Data Analysis

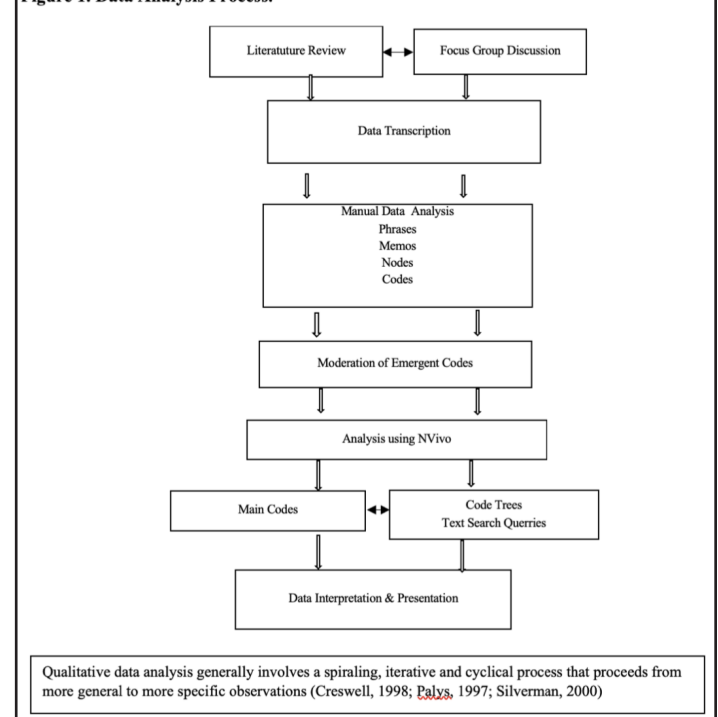
We used SPSS (Version 25) to analyze data collected on participants' demographics to generate frequencies and percentages across characteristics. The FGD was audiotaped and subsequently transcribed by a professional transcription service. The investigators uploaded codes into an NVivo 12 database for review and further coding. NVivo was used to validate the data through additional coding and to generate visualization tools to explore ideas or present the connections in the data. We used tree maps, and word counts commonly referred to "Text Search Queries" to ensure that there were relationships between words and phrases and the emergent codes to validate the data. The analysis involved a reflection action process (praxis), where the research team moved back and forth with the data to unearth new relationships within and between the data. Figure 1 presents details about the data analysis process.

Consistent with Creswell et al. (2007), qualitative data analysis involves four essential steps: (a) raw data management (data cleaning); (b) data reduction (chunking, coding); (c) data interpretation (coding, clustering); and (d) data representation (telling the story, making sense of the data for others). Qualitative data analysis generally involves a spiraling, iterative, and cyclical process that proceeds from more general to more specific observations (Creswell et al., 2007). For qualitative data to be analyzed, it must first be grouped into meaningful patterns or themes that the investigators observed. The research team utilized thematic analyses to code interview data for themes from the participants' perspectives.

The thematic analysis process included open coding, memo writing, and constant data comparison, which are elements close-

Number	Gender	Ethnicity/Race	Disability Status	Profession	Type of Service
1	Female	African American	No	Mental Health	Mental Health Treatment (Outpatient)
2	Female	African American	No	Licensed Counsellor, Licensed Alcohol and & Drug Counsellor	Substance Abuse (Inpatient)
3	Male	African American	No	CRC, LPC-S	Vocational Rehabilitation
4	Female	African American	No	CRC	Vocational Rehabilitation
5	Female	African Americans	No	LPC Candidate	Vocational Rehab Substance Abuse (Outpatient/Inpatient) Mental Health (Inpatient/Outpatient)
6	Female	African American	No	LPC/CADC	Substance Abuse (Outpatient/Inpatient) Mental Health (Outpatient/Inpatient)
7	Male	Native American	No	Consultant/Mental Health Researcher	Mental Health (Inpatient/Outpatient)
8	Female	Native American	Yes	LCSW, LADMH-S	
9	Female	Native American	No		Vocational Rehabilitation
10	Female	Native American	No		Vocational Rehabilitation
11	Male	African American	No	Licensed Social Worker	Social Worker Substance Abuse (Inpatient/Outpatient)
12	Female	White	No	Licensed Alcohol and & Drug Counsellor	

Figure 1. Data Analysis Process.



ly aligned with a Grounded theory approach (Strauss & Corbin, 1994). The research team carried out manual coding procedures and developed an agreed-upon codebook. Where there were disagreements, a fellow researcher or the lead investigator moderated, and a new code developed. This was done in three circles to ensure no missing data or conflicting data were in the codebook. The actual process of coding was an integral part of the interview data analysis process. Coding is assigning codes (that have been previously defined or operationalized in a codebook) to raw data. The codes were reviewed for reliability by three investigators; one senior level professional researcher with an expertise in qualitative data analysis. This peer-check system whereby the three investigators cross-checked categorizations and statement codes created multiple discussions that eventually led to 100% agreement of the final set of codes.

This review allowed researchers to engage in data reduction and simplification. It also allowed for data expansion (making new connections between concepts), transformation (converting data into meaningful units), and reconceptualization (rethinking theoretical associations). Since qualitative data are thick, rich, and descriptive, the research team used triangulation (using multiple data sources in an investigation to produce understanding) to clarify research bias through peer review, as recommended by Creswell (1998).

Memoing

Memoing is recording reflective notes about what the investigators are learning from the data (Patel et al., 2016). Since memos were the investigators’ notes during data collection and data analysis processes, they did not code the memos but used them to reflect and confirm their interpretation of the emerging coding process. Memos provided a critical tool for organizing the data, the opportunity for reflecting on the data, identifying themes and topics, and the formulating of questions about the data. This reflective process allowed the investigators to understand better the data and its relation to the research questions. In qualitative research, the researcher is also a data collection instrument (Bourke, 2014). With this understanding, we maintained, throughout the research process, an informed reflexive awareness to contextualize our position in relation to the research process. In this process, we discussed and addressed any biases and assumptions throughout data collection, analysis, and interpretation.

Results

The following sections highlight key findings from our analysis of FGD data collected about participants’ perceptions of barriers that impede and solutions to improve community living outcomes among target group members. In particular, the sections contain descriptive illustrations to identify and illuminate their perspectives. The main themes that emerged were (a) proliferation of opioids in the community, (b) treatment access barriers, (c) employment, (d) transportation, (e) partnerships, and (f) community participation. Table 2 shows the barriers and strategies that could address inequities.

Barriers to Community Living Outcomes

The Proliferation of Opioids in the Communities

All the focus group participants noted that both prescription and nonprescription opioids are historical and that opioids are readily available within their communities due to either the users being negligent, levels of addiction, and the low prices of nonprescription opioids. One of the participants expressed that the opioid issue is not new, especially among people of color. The participant stated that:

“One of the things I’d like to touch on if I can, even with you asking about this, let’s step back in time for a minute because what I keep hearing is the pain component. Let’s go back to 1970, ‘71, ‘72, when people started dabbling with heroin because that was a big deal. Back then, you had people that were IV drug users. And they weren’t doing it because they were in pain. They were doing it because they wanted to be high. It’s euphoric. It’s probably one of the most euphoric drugs there is” (Participant 2).

Further, the participants expressed that according to their experiences, children and the youths are vulnerable because opioids are readily available to children through their parents, caregivers, and peers who use opioids:

Barriers	Strategies
<i>The proliferation of opioids in the communities</i>	<ul style="list-style-type: none"> • Implement a comprehensive, holistic approach • Involve the community and develop multisectoral, diverse community partnerships • Increase culturally relevant public awareness • Employ culturally specific engagement
Treatment access barriers	<p style="text-align: right;">Strategies</p> <ul style="list-style-type: none"> • <i>Expansion of health care services</i> • Medication-Assisted Treatment (MAT). • Creating safe, comprehensive healing spaces in the affected communities • Engaging peer recovery coaches
Employment-Related Barriers	<p style="text-align: right;">Strategies</p> <ul style="list-style-type: none"> • <i>On-the-job training and bonding</i> • Create a culturally relevant and diverse workforce • Building and developing a culturally sensitive and diverse
<ul style="list-style-type: none"> • Joblessness and self-employment • Low wages and poor living conditions • Low social, economic status • Absent Lack of skills • Absenteeism • Unfriendly human resource policies • <i>Stigma</i> 	
Transport Related Barriers	<p style="text-align: right;">Strategies</p> <ul style="list-style-type: none"> • Development of Additional Road Capacity • Disability Awareness • Safe and Accessible Rights-of-Way • Dedicated funding for public transit
<ul style="list-style-type: none"> • Accessibility • Public Transportation Barriers 	<ul style="list-style-type: none"> • Network and collaborate with faith-based organizations
Partnership Barriers	<ul style="list-style-type: none"> • Involve federal, state and local institutions • Establish partnerships with local health institutions • Identify and collaborate with local service providers
Community Participation Barriers	<p style="text-align: right;">Strategies</p> <ul style="list-style-type: none"> • Involving the community and developing multi sectoral and diverse community partnerships • Identification and involvement of community based first responders • Meeting people at the point of their needs • Building trust and good working relationships between the community and law enforcement
<ul style="list-style-type: none"> • Lack of coordination between service providers, state, federal and local institutions 	
<ul style="list-style-type: none"> • Lack of or inadequate community engagement by service providers 	

“Even the children having access through the parents because they’re there and they already have some of the medications that they’re already taking, so another pill to pop or drug to have access to is still available within the home.” (Participant, 6).

According to the participants, most people with disabilities are prescribed opioids to manage chronic pain. Over time they get addicted and cannot stay without. Living with a disability is challenging enough without adding an opioid use disorder. This was corroborated by the following statement from one of the participants:

“Some of the clients that I deal with normally will tell me about an accident that they’ve had. I had one couple who they were both in a horrendous accident; she hurt her back; he hurt his knees, his hips, all kinds of surgeries they had to have. And they were both given oxycodone from the doctor. And after a while, it just didn’t work anymore” (Participant 1).

Additionally, the participants stated that the commonly available opioids in their community are narcotics like heroin and cocaine. This was well expressed by a statement from one of the participants:

“I think what we see mostly is narcotics and hydrocodone, oxycodone, fentanyl patches. One of the things that I think we have to address and look at, even when talking about like the crack cocaine epidemic, the reason why I think this is so broad and that there’s such urgency is that people from all walks of life are being prescribed these opioids” (Participant 2).

Focus group participants articulated that prescription opioids have also been the foundation of opioid use disorder because many people with disabilities are prescribed opioids to manage their pain. Once they run out and have no insurance, they resort to heroin:

“What I would see often was they would start with prescription medication. And that would vary by time, and then heroin would slowly be introduced. And that would be the one that they would hide because they would say it’s illicit even though it’s still an opiate” (Participant 14).

Treatment Access Barriers

Focus group participants maintained several points here. First,

people of color with disabilities have historically faced barriers in accessing health and other services. These barriers are related to the availability of services, how services are provided, service location, and service providers’ organizational configurations. They also contended that factors such as poverty, education status, race, and ethnicity, gender, insurance status, and other factors that influence the quality, quantity, and availability of health services have influenced the extent to which people of color with disabilities access services in the U.S. Additionally, the participants stated, these racial health disparities have historically impacted people of color with disabilities:

“There is a lot of racial and ethnic health care disparities between Whites and minorities which range from where the minorities live, lack of access to adequate health coverage, communication difficulties between patient and provider, cultural barriers, provider stereotyping, and lack of access to providers” (Participant 1).

The focus group participants also expressed that people of color with disabilities who have used opioids for long periods develop medical complications and have less access to treatment centers. They further expressed that this reality is more pronounced among people with a physical disability. Such was expressed by a participant who stated that:

“Ongoing substance abuse makes it even more difficult to get to the doctor, and it’s been found that drug abuse decreases the chance that a patient will follow medical advice, such as taking medication and going to physical therapy” (Participant 11).

In other comments by the participants, they expressed that people of color with disabilities have higher chances of facing more health challenges like infections, which can easily be exacerbated by the use of particular prescription medications for long periods, develop medical complications, and have less access to treatment centers, which again, can be more pronounced among people with physical disability:

“Individuals with physical disabilities are already prone to additional health problems like infection and inflammation that can be worsened by the use of certain substances. Becoming intoxicated also typically reduces coordination, increasing the chance of injury” (Participant 9).

Employment-Related Barriers

Joblessness and Self-Employment. Focus group participants noted that employment has been shown to improve stability, health, and social wellbeing; therefore, the lack of employment limits opportunities for people of color with disabilities. Participants also

felt that those with a comorbid opioid use disorder also have less access to quality community living outcomes. They also indicated that persons of color with disabilities with opioid use disorder are more likely to be jobless, work part-time, or be self-employed than those without disabilities. This notion was supported by a participant who stated that:

“I would say from my perspective, I’ve worked in social services; from a social services standpoint, or individuals trying to apply for disability, it seemed like they were greatly affected by it and unable to hold a job, not necessarily because of the actual disabilities they had, but because of the opioids. So, whether it was a heroin addiction or prescription medication addiction, they were more physically unable to work and engage and work because of that condition, primary to whatever it was that they were dealing with” (Participant 13).

Low Wages and Poor Living Conditions. Focus group participants stated that lack of employment or low wages for people of color with disabilities with opioid use disorder has also been associated with their poor living conditions. Accordingly, participants maintained that this has forced them to live in marginalized neighborhoods with poor and unsafe living conditions:

“I think it forces them to continue to live in a lower SES, [section 8 federally subsidized housing], you know, diminishing lives with low resources because they’re not able to sustain employment or they’re on a fixed income or on a federal welfare program like SSI, which only pays someone like maybe \$750 a month. So, I think living in what they call, quote-unquote, the ghetto or slums, is what they’re accustomed to because of being disabled, being a minority, and being addicted to opioids” (Participant 13).

Low Socioeconomic Status. Focus group respondents further articulated that low socioeconomic status (SES) and its correlation with lower educational achievement, poverty, and poor health ultimately affects members of the target population. An additional point made was that a fair number are parents themselves. Accordingly, since most parents with disabilities live in communities with their families, many grandparents provide care to both their own adult children (because they may be functionally incapacitated) along with the children of those incapacitated parents (i.e., the functioning grandparents’ grandchildren).

“We’ve got a high percentage of grandparents raising grandchildren and great-grandchildren now, and it’s there’s no end in sight for it. So, I think the effect on the community living, especially in our area, is generational. It’s not

just going to stop with this generation” (Participant 10).

According to the focus group participants, the opioid crisis has also been associated with creating challenges for people of color or with disabilities who use opioids due to addiction. Specifically, this notion is reinforced in that many are not able to adhere to treatment regimes, and others do not complete treatment programs:

“From a social services standpoint, or individuals trying to apply for disability, it seemed like they were greatly affected by it and unable to hold a job, not necessarily because of it’s very difficult for them now to hold and maintain jobs because of their addiction, be they are unable to engage throughout the program; it was a 12-month program, so a lot of them did not complete the program because they were unable to fulfill the requirement of doing a weekly session and being clean. It was less about the actual disabilities they had, but because of the opioids” (Participant 13).

Absenteeism. Participants in the focus groups also commented that people of color with disabilities who have opioid use disorder could not keep jobs because of job-related gaps in their work history and absenteeism. These issues have contributed to the challenge of finding jobs for people of color with disabilities, more so, those that have opioid use disorder. The participants also expressed that most people of color with disabilities who have opioid use disorder are affected by the drugs, which affect their abilities to perform on the job:

“Absenteeism is a lot. They don’t have a good record of going to work because if you don’t have your drug, then you don’t feel like getting out of bed or doing any of those things. And then also the relationships with the people that you’re working with suffer a lot when you’re in the throes of full-blown addiction” (Participant 10).

“What happened during these six months? What happened during these eight months?” And, all of those gaps in employment that people want to know about. And, as an employer, that’s important, but there’s such a stigma. And to say, “I was going through a really tough time,” or, “I was in treatment at that time” is not what folks want to say. And so, what I have observed is that people tend to have a real problem getting a successful job or career started because of those gaps and because they

haven't been going to work and that sort of thing (Participant 12).

Lack of Skills. Lack of skills required for accessing jobs was another factor that the participants expressed as a big challenge. Due to low rates of high school and college completion, they do not typically access well-paid jobs that are needed to support a good life:

“The barriers that I saw in practice were no specialized skills among those who are disabled with opioid use, and no transferable skills, and low education. They may have a GED or a high school education; some don't. Others may have just had the high school education and maybe some military involvement, which's pretty much it. So, the best thing to do is getting a janitorial job” (Participant 13).

Unfriendly Human Resource Policies. Unfriendly human resource policies significantly impact their employability according to focus group participants. The use of drug tests as a requirement for employment has contributed to many who abuse opioids to manage their pain and for recreational use to miss job opportunities due to positive results during the interview process:

“I think most employers, H.R. departments, are not geared or equipped or even ready to speak to this. H.R. policies are read in a very particular way. Those get carried out in a very certain way that doesn't leave room for an individual who may be recovering or stepping back into the workforce. And so, I think it would be crucial, as part prevention, but then also just moving forward as we address this in our nation, that H.R. policy, period, for any employer, is going to need to look at this differently. This is especially true if we want this to be a national thing that we move forward and get better at this, not just in one state or one area. H.R. policy really dictates how a lot of managers and people can run their company. So, H.R. would need to be educated, equipped, and policy may need to be rewritten in certain areas (Participant 11).

Stigma. The stigmatization of opioid addiction among people of color with disabilities negatively impacts community living outcomes according to participants. Nearly all perceived stigmatization as a barrier to successful outcomes. They also mentioned that stigmatization levels are much higher for people with visible disabilities:

“But because of that stigma, we're having a

hard time getting people to say 'yes' because of fear so that they cannot get services. And so, I think the stigma is another thing.” (Participant 12).

According to the participants, stigmatization is historical, more so among Native Americans who have experienced marginalization over time. According to one of the participants:

“With Natives, I think it's the distrust and that the stigma is historic. I don't want other people to know because we're a close community. As a minority group, we keep running into this, “I'm not coming in there because you'll talk to my cousin, and my cousin will know it before I know, before I get home, what my diagnosis is.” (Participant 9).

Poor health outcomes for target population members are also associated with the internalization and anticipation of public stigma, which is linked to opioid use disorder according to focus group participants:

“When people with disabilities with opioid use disorder internalize or anticipate the public stigma attached to their illness, they disengage themselves from care leading to poor health” (Participant 1).

Participants also felt that stigmatization was also associated with incarceration and the fear related to disclosure. The stigma of felony convictions and incarceration follows people long after their court mandated discharge. Discrimination against formerly incarcerated people disproportionately affects people of color with disabilities with opioid use disorder:

“When I worked at the Department of Rehabilitation Services, numerous clients that I served had a previous criminal background. So now they've got the substance abuse issue. You've got the disability, and you've been incarcerated. Or you're a convicted felon, and you haven't been to prison yet, but you have that conviction. That's a lot to overcome. We also have to look at the stigma around being a convicted felon” (Participant 2).

Inadequate Transportation

Access to transportation was identified by focus group participants as a primary means to address target population members' independence and self-determination. Participants expressed that these individuals face challenges in accessing transportation needed to participate in daily living activities and accessing health services. Further, participants felt that rural communities face even greater barriers to accessible transportation. The lack of funding to

rural communities means that public transit is either unavailable or inadequate; hence, limiting access to transportation services:

“One of the things that I think people don’t discuss enough is transportation. So, transportation is a big problem, and I don’t think it’s being looked at to the same degree that is probably needed in this state” (Participant 1).

Further, the service providers expressed that people of color with disabilities who have opioid use disorder in Oklahoma have challenges accessing transportation:

“One of the things that I think people don’t discuss enough is transportation because Oklahoma does not have a public transportation system. They say we do, but it’s not really. I mean, we don’t have a mass transit system. It stops at a certain time. It only runs on certain days, and it doesn’t go everywhere. And so that’s really important” (Participant 13).

Solutions to Community Living Outcome Inequities

On-going race-based disparities in U.S. rehabilitation systems are well documented according to focus group members. In order to address such inequities in community living outcomes context among members of the target population, a comprehensive, multi-layered, and multi-agency approach is needed. The strategies that follow were identified by FGD participants as potential components to an emerging framework for addressing the challenges that were also identified in this study.

Building Partnerships and Inter-agency Collaboration

To help meet the community living needs for people with disabilities, the U.S. Department of Health and Human Services (HHS) created a new organization in the ACL. This agency addresses their community living challenges and promotes formal partnerships to resolve issues involving hospitals/health systems, public health departments, state vocational rehabilitation agencies, and other stakeholder entities that share a commitment to improving related outcomes. Participants felt that creating effective partnerships within communities was a strategy to ensure that target population members have access to health and other rehabilitation services that lead to positive community living outcomes. Furthermore, participants stated that hospitals and community organizations would enable providers to assess the effectiveness of their partnerships through surveys and coalition member assessments:

“And so, when they have no skills, and they have a criminal background, it limits the type of jobs they can have. And so, what I saw at the V.A. hospital is they would partner with communities that knew about the background like Goodwill Industries, that will hire individuals who have a criminal back-

ground. I’m not sure what all the facets are. But that agency specifically is a felon-friendly agency. And there’s a list that you can get from like the unemployment office and things like that” (Participant 13).

Partnerships with felon friendly agencies and unemployment offices within communities were also seen to be opportunities for people of color with disabilities with opioid use disorder as well as criminal history according to focus group participants:

“I think having more agencies, and even government agencies that allow individuals that have like a non-criminal background, or even criminal background, but just tailored to where they can work would be helpful. If that participation was stronger, it would allow for individuals to gain employment with their background. So, I think community involvement, business alliances with government and temp agencies, hiring agencies, and so forth are all needed” (Participant 13).

On-the-Job Training

Since many people of color have been found to have low education levels and lack the skills required in the job market (Ajilore, 2020), job training was suggested by the focus group members as one of the strategies to those with disabilities and opioid use disorder help them access jobs. According to the participants, training on the job has also been found to help employees feel more confident in their skills. The participants further stated that when people with disabilities feel competent in the workplace, they get motivated as well in making their workplaces less likely to experience turnover due to someone quitting or not meeting performance expectations:

“And they will give them the training that they need. And it’s in an area that’s needed. For instance, in the windmill and the energy field, they teach them how to repair those windmills and things like that, because there’s really no place out there for people to learn how to do that. And so, they use this program as a way to give them a skill. And it pays well. And if they stay in the program, they’re able to meet the needs of the client, and secure something out in the industry, this will give them a skill that they can carry forward. So, I think if we had more things like that, it would be much more helpful.” (Participant 1).

Job Bonding

Participants stated that job bonding by companies that employ target population members could represent an effective strategy to

securing employment. Bonding is a type of insurance for the employer that protects them from employee theft and also compensates the employer in cases of property loss caused by an employee due to the effects of opioid use disorder or other related accidents:

“Companies have what’s called being bonded, and that’s what they do. They can have insurability. If an insurance company is willing to bond that person to ensure that if they do something damaging, this company will be reimbursed” (Participant 2).

Expansion of Health Care Services

Most focus group participants agreed that the health care system needs reforms that address the demands of target population members. The services that need to be expanded include Medicaid/Medicare and transportation access in rural areas as well as increased funding from the government:

“And then if you have Medicaid or Medicare, you can get like Sooner Ride, where they’ll take you to your medical appointments. Often, these people who are addicted and disabled live in very rural, isolated areas. So, they’re going to primary care doctors in their area who are just writing prescriptions. And so, having these programs and tribal programs and community programs and nonprofits are important. But we need to expand them somehow to reach more people” (Participant 10).

Focus group participants overemphasized the involvement of the government in the expansion of health care services. They suggested that the government increase funding to rural communities who are most affected by the dilapidated health service delivery infrastructure. While it is recommended that the government’s role is essential, solutions to mitigate the role of gatekeepers should be implemented to result in a more streamlined process:

I’m thinking about the role of the government. Sometimes it’s like as soon as you get the government involved, it has its positives. But it’s essential also to note that whenever there is money which comes, there are gatekeepers. I guess, the gatekeepers to the funds, you know, are making sure that it’s done with the right spirit, the right heart. And that’s hard, of course, to make sure” (Participant 6).

Community Participation

Focus group participants felt that local community institutions play a significant role in providing support and care for people of color with disabilities experiencing opioid use disorder. Commu-

nity participation was associated with community-owned and driven initiatives and service provision. According to the participants, grassroots organizations effectively address challenges facing people of color with disabilities with opioid use disorder. These organizations help communities in the development of community healing and restoration processes:

“I think more grassroots-driven and grassroots-owned--I’m searching for a term--programs. I mean, I have to say this: this country’s been through cycles and cycles of abuse and drugs and service community responses to such abuse. We need restoration and healthy communities. And those are the two examples of true restoration and dignity and community healing. I mean we’re so fragmented, and we need some holistic healing” (Participant 9).

According to the study participants, community participation was also vital in enabling local communities to collaborate in open discussions about the opioid use disorder. These types of engagements allow community organizations to respond to the interests of people of color with disabilities with opioid use disorder to develop initiatives that are customer driven and culturally appropriate:

“I do agree with what you’re saying. I think we need to have things that are more consumer driven. How do you have a conversation about someone with a substance abuse problem, and they’re not at the table? How do you have a conversation about someone with a disability needing a place to live, but they’re not at the table? I mean, this is what we do and see all the time. It has to be consumer driven. The person needs to be at the table to speak to what they need and want. I can’t tell someone what your needs are” (Participant 2).

Discussion

The purpose of this study was to examine vocational rehabilitation, substance abuse, and mental health service providers’ (e.g., counselors and clinicians) perceptions about barriers that impede and solutions that could improve poor community living outcomes for people of color with disabilities who have opioid use disorder. Limited research on such factors continue to hinder effective response interventions across the field. For this reason, investigating these disparities is essential. Accordingly, the findings from the current study identified six key themes as barriers: (a) proliferation of opioids in the community; (b) treatment access barriers; (c) employment; (d) transportation; (e) partnerships; and (f) community participation. Participants also acknowledged various solutions, and among those were (a) building partnerships and inter-agency collaborations, (b) on-the-job training and job bonding, and (c) ex-

pansion of health care services. Our research also found that participants' perceptions were remarkably consistent, and there was a clear consensus about the issues that mattered to them. Within this context, we discuss key barriers and select strategies that can be considered by the field for addressing poor community living outcomes.

Proliferation of Opioids in Community

In order to address the issue of excessive availability of opioids in communities of color, the following strategies could be considered by the field. First, there may be a need to develop a more comprehensive holistic approach that will lead to economic stability and neighborhood safety. For example, a grassroots neighborhood council comprised of members from the target population, clinical service providers, and other interested parties should be convened to begin brainstorming the specific economic stability and neighborhood safety interventions. Second, there is a need to increase culturally relevant public awareness by utilizing communication media that are appealing and engaging for the community. This strategy would derive primarily from those media entities in the community that cater to the target population. Additionally, public service announcements and billboard campaigns might be useful for educating the target population about the dangers of opioid use and treatment. The impetus for rolling out these strategies must come from partnerships between provider agencies and target population members.

Treatment Access Barriers

To address treatment access barriers for target population members, the following strategies might be considered: (a) expand healthcare services through systematic, focused and sustained advocacy efforts aimed at local providers and third-party payers; (b) increase the availability of Medication-Assisted Treatment by launching enhanced case finding approaches that zero-in on this target population and developing incentives (e.g., additional recognition in the community) for existing providers to serve them; (c) create safe, comprehensive healing spaces in affected communities of color by earmarking designated office space of traditional clinical providers as well as non-traditional entities (e.g., public libraries, churches, shelters, etc.) as "drop-in space"; (d) engage peer recovery coaches by initially reviewing the literature on peer services in rehabilitation and benchmarking existing services across the nation; and (d) pilot and refine through lessons learned a leading peer coaching model.

Employment-Related Barriers

The findings indicate that target population members experience various employment related barriers to include joblessness, low wages, lack of skills, and absenteeism. These factors contribute to considerable socioeconomic disparities with a massive percentage point increase in low status indicators between those with only one disability type and individuals with none (Stevens et al., 2016). Additionally, we found that stigmatization was also a barrier to enabling them to achieve successful community living outcomes. Stigma affects health through stress and other physical pathways. Many people of color with disabilities who experience opioid use disorder are exposed to multiple stigmas, which prevent them from attaining needed health, education, employment, housing, and transportation supports and resources. Stigma in

healthcare systems can be particularly harmful, as target population members may be prevented from accessing the services they need, creating mistrust and further exclusion.

When people of color with disabilities feel competent in the workplace, they get motivated and consequently workplaces can experience lower turnover due to attrition or performance expectation discrepancies. Since many people from this population have been found to have low education levels and lack the skills required in the job market, job training was identified as one potential strategy to help them access jobs (Schultz et al., 2020). Job bonding by companies that employ people of color with disabilities who have opioid use disorder or are in treatment was also found to be one of the ways in which they can gain employment. Bonding is a type of insurance that protects the employer from employee theft and also compensates the employer in cases of property loss caused by an employee due to the effects of opioid use disorder.

Transportation-Related Barriers

Our study found that people of color with disabilities with opioid use disorder face various mobility and transportation challenges. While the physical accessibility of public transportation increased nationwide following the Americans With Disabilities Act's (ADA) initial passage in 1990 and re-authorization in 2008, many transportation barriers within fixed-route systems are still widespread. Transportation accessibility has been identified as a primary means to address people of color with disabilities' independence and self-determination (Frieden, 2005; Wehmeyer et al., 1996). Understanding the role of transportation access in social exclusion is necessary to assure their full participation in all aspects of society (Yigitcanlar et al., 2012). The main concerns about transportation related barriers identified were basic awareness of intended users, accessibility, and capacity of public transportation systems.

Building Partnerships

The study found that building partnerships and inter-agency collaborations could address community living challenges faced by target group members. Interagency collaboration is seen as a means of improving their access to primary treatment services. Such partnerships help improve access to services, reduce service gaps (Henderson et al., 2019), healthcare costs by using existing resources, and service duplication, and enhance equity in service provision (Cooper et al., 2016). Creating effective partnerships within communities was seen as another way of ensuring that they have access to health and other rehabilitation services that lead to positive outcomes. Further, hospitals and community organizations can assess their partnerships' effectiveness through surveys and coalition member assessments. This inability to integrate people of color with disabilities and opioid use disorder into the health care system and society at large must be a focal point for policy making, including the Medicare and Medicaid programs moving forward.

The involvement of government, state, and local institutions in the expansion of health care services was overstated and to achieve this goal, health services need to be adequately funded. However, the vulnerability of the people of color with disabilities with the opioid disorder does not stem simply from having a dis-

ability or opioid use disorder; more importantly, like other vulnerable populations, they are not well integrated into the health care system because of specific characteristics (Institute of Medicine, 2003).

Community Participation

Finally, our study found that community participation in health offers various advantages, among which are helping communities to develop problem-solving skills, making them take responsibility for their health and welfare, ensuring that the needs of the community are adequately addressed, ensuring that the strategies and methods used are culturally and socially appropriate or acceptable, and finally, enhancing sustainability. These findings are consistent with those that other researchers have found (i.e., Haldane et al., 2019) where community participation was widely seen to benefit the development, implementation, and evaluation of health services.

Limitations and Future Research

Our study had two main limitations. First, the use of a single focus group was a constraint whereas additional perspectives might have been garnered from multiple focus groups. Second, this inquiry explored the perspectives of providers rather than persons of color with disabilities who experience opioid use disorder. This limitation might have restricted the richness of the new information gleaned from target group member perspectives. Although this study contributes to the literature, it is a first of its kind, and so there are additional opportunities for inquiry. Future qualitative studies could facilitate multiple focus group discussions, while including target group members as participants. Furthermore, there appears to be little quantitatively derived research examining these individuals' community living outcomes. However, it makes some sense to start a new path of investigation within a new topic area, at least initially using a qualitative approach to gain an understanding of the basic nature of the phenomenon up close and personal. There could also be numerous possibilities for mixed methods approaches that could generate new knowledge about the challenges and solutions that address poor community living outcomes.

Conclusion

Community living outcome disparities for people of color with disabilities who have opioid use disorder are significant. As this study points out, they continue to experience various challenges that impact negatively upon their community living aspirations. The findings from the current study represent a starting point for subsequent analysis of outcome factors. Ultimately, a long-term body of research on this topic could result in the development of clear strategies associated with provider treatment services, supports that family members can provide, community-based strategies, and the policies that may be needed address poor outcomes. To this end, federal funding agencies should consider sponsoring research that generates new information on barriers that can inform policy, research, and practice as well as strategies that address the deficiencies inherent in the health care systems that serve this target population. The mitigation of poor outcomes will only be realized through funding that sets this problem as a priority, rig-

orous research, and the development of evidence-based practices that are provided in the field.

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COVID-19 Health and Rehabilitation Implications Among Multiply Marginalized People of Color with Disabilities: A Scoping Review

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The purpose of this scoping review was to examine the literature about Coronavirus disease 2019 (COVID-19) and health and rehabilitation implications for persons of color, including those with multiple marginalized statuses (i.e., racial/ethnic minority and disability), and map out research gaps. Several themes emerged from this review that included disproportionate burdens of infections, hospitalizations and deaths; structural racism as a driver of inequity; diminished employment opportunities, and limited data on race and disability. The findings revealed the existence of serious evidence gaps relating to multiply marginalized people of color with disabilities within the COVID-19 context. A clear need exists for more research on COVID-19 outcomes disaggregated by disability and race so that the field has a fuller understanding of the impact of the pandemic on people of color with disabilities. Additionally, minority serving institutions (e.g., HBCUs and TCUs), as experts in addressing marginalized communities' needs, should play a leadership role in equity research.

Keywords: COVID-19, People of Color with Disabilities, Employment, Health, and Community Living Equity, Minority-Serving Institutions

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The coronavirus disease 2019 (COVID-19), which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a global pandemic that has immensely disrupted several systems such as employment, education, health-care, and community living. Since its detection in December of 2019 in Wuhan, China (Zhu et al., 2020), the virus has spread

rapidly across the world resulting in increased morbidity, mortality, and inequalities (Moore et al., 2020). COVID-19 is currently considered the most severe global infectious disease pandemic of the modern human history. The first confirmed case in the United States (U.S.) was reported on January 20, 2020 (Burke et al., 2020). The pandemic was the third leading cause of death in the U.S. in 2020, resulting in approximately 375,000 deaths (Angulo et al., 2021). Like many major public health and economic crises, this COVID-19 has disproportionately affected people of color (i.e., African Americans, Hispanic or Latino, Native Americans, and Asians and Pacific Islanders) (Chen et al., 2020; Garg et al., 2020; Hofschneider, 2020; Mineo, 2020; Raifman & Raifman, 2020). As of February 5, 2021, almost 26.7 million cases were reported across the U.S. (Ahmad et al., 2021; Angulo et al., 2021). As of February 5, 2021, almost 26.7 million cases were reported across the U.S. (Ahmad et al., 2021; Angulo et al., 2021). Unfortunately, COVID-19 mortality and morbidity cases continue to grow across the nation and globally.

Disproportionate Incidence in Communities of Color

The disproportionate burden of COVID-19 on people of color in the U.S. is now well documented (American Public Media [APM] Research Lab., 2021; Garg et al., 2020; Golestaneh et al., 2020; Holmes et al. 2020; Karaca-Mandic et al., 2021; Price-Haywood et al., 2020; Williams & Cooper, 2020; Yancy, 2020). Specifically, minority racial and ethnic groups are more likely to contract the virus and die from consequential complications (Golestaneh et al., 2020; Holmes et al. 2020; Karaca-Mandic et al., 2021; Muñoz-Price et al., 2020; Raifman & Raifman, 2020). The U.S. Centers for Disease Control and Prevention (CDC) evaluated data from 580 patients hospitalized with lab-confirmed COVID-19 and found that 33% were African Americans compared to 18% in the community (Garg et al., 2020). Conversely, this agency reported that 45% of individuals for whom race or ethnicity data was available were White compared to 55% of individuals in the surrounding community. In a weekly report for the period ending June 27, 2020, the CDC indicated that of the 33,277 laboratory-confirmed COVID-19-associated hospitalized cases, 31,486 (94.6%) had information on race and ethnicity. Of these cases, Native Americans, African Americans, and Hispanic/Latino had an age-adjusted hospitalization rate approximately 5.7 times, 4.7 times, and 4.5 times that of Whites, respectively (CDC, 2020). Recent data show that age-adjusted mortality rates among African American and Hispanic/Latino populations are 3.6 and 3.2 times higher, respectively than for the non-Latino White population (APM Research Lab., 2021; Egbert & Liao, 2020). Data for Asian Americans and Pacific Islanders are mostly missing; however, available information indicates they are among those hit hardest by the pandemic. For example, in Arkansas, where they make up only about 0.3% of Arkansas' population, they comprise about 1.2% of coronavirus cases in the state and 1.4% (or about four times more than their share of the population) of all related deaths (Hofschneider, 2020). Other studies (e.g., Wang et al., 2020) have reported disproportionate mortality rates for Asian Americans and Pacific Islanders in Nevada (15.4% of deaths versus 8.1% of the population), Utah (5.5% versus 2.4%), and Nebraska (5.9% versus 2.4%).

Researchers investigating excess deaths associated with COVID-19 have also reported that people of color experience

alarmingly higher percentage increases in bereavements (Chen et al., 2020; Chen et al., 2021; Rossen et al., 2020). Excess deaths are defined as the number of persons who have died from all causes, in excess of the expected number of deaths for a given place and time (Rossen et al., 2020). In addition, Post-Acute Sequelae of SARS-CoV-2 Infection or Long COVID has emerged as one of the most disturbing consequences of the pandemic. People with Long COVID, sometimes referred to as long-haulers, continue to experience symptoms (e.g., fatigue, neurocognitive difficulties, depression, and other mental health conditions) related to COVID-19 for several months or longer after the acute phase of infection (Carvalho-Schneider et al., 2020; Huang et al., 2021). It is estimated that 10% of people experience Long COVID (Carvalho-Schneider, 2020; Huang et al., 2021). Unfortunately, people of color are more likely than Whites to experience Long COVID because they are disproportionately impacted by the pandemic.

In general, COVID-19 has spotlighted what researchers have documented for decades; African Americans and other people of color experience pervasive disparities that are directly linked to structured inequality at intersections of racial/ethnic minority status and class, as well as occupation (Bowleg, 2020). This state of affairs further indicates how race and ethnicity are risk indicators for other underlying social determinants of health (SDOH) (e.g., discrimination, economic, and educational disadvantages) that generate inequalities and inequities in society (National Institutes of Health, [NIH], 2020). The World Health Organization (WHO) defines SDOH as the conditions in which people are born, grow, live, work, and age, such as education, employment, income, health, and other factors such as homeownership, voting access, wages, and incarceration (Rogers et al., 2020). In the U.S., like in many parts of the world, those who have political and economic power determine how these conditions are structured and experienced.

Multiply Marginalized People of Color with Disabilities and Social Determinants of Health

Many individuals with disabilities are at higher risk of contracting COVID-19 and developing severe complications or increased mortality in some cases due to the prevalence of pre-existing health conditions (e.g., chronic lung disease, diabetes, or a weakened immune system) or their living in institutional settings (CDC, 2020; Garg et al., 2020; Landes et al., 2020; Price-Haywood et al., 2020; Turk et al., 2020). For example, according to the CDC (2020), adults with disabilities are three times more likely than adults without disabilities to have comorbidities (e.g., heart disease, stroke, diabetes, or cancer) that are associated with poorer COVID-19 outcomes. Another study (Turk et al., 2020) that utilized data from the TriNetX COVID-19 Research Network platform to compare COVID-19 trends among people with and without intellectual and developmental disabilities (IDD), found that pandemic appeared to present a greater risk to people with IDD, especially at younger ages.

Compared to their White counterparts, multiply marginalized people of color with disabilities suffer a "double whammy." First, they appear to be at greater risk of contracting the virus and dying from it. Second, they belong to a group of people (i.e., traditionally underserved racial and ethnic minorities) who experience

long-standing systemic social, economic, and political inequities that the pandemic has made more visible (Garg et al., 2020; Laurencin & McClinton, 2020; Krishnan et al., 2020). COVID-19 presents various SDOH risks for people of color with disabilities. Below we briefly discuss SDOH factors in five contexts (i.e., discrimination and systemic obstacles, diminished employment opportunities, community living and participation, health and function, and assistive technology).

Discrimination and Systemic Obstacles

A substantial body of knowledge exists (Jones et al., 2009; Krishnan et al., 2020; Moore et al. 2020; Moore et al., 2016; National Academies of Sciences, Engineering, and Medicine [NAS], 2016) documenting that people of color have historically experienced long-standing intersectional and multiple layers of discrimination because of their race and ethnicity. Healthy People 2020 identifies discrimination based on race and ethnicity as a major factor that affects a person's health and wellbeing (Gómez et al., 2021; Ochiai et al., 2021; Office of Disease Prevention and Health Promotion [ODPHP], n.d.). Healthy People 2030 also identifies people with disabilities as more likely to be negatively affected by health disparities than the general population and recommends multiple approaches to these health disparities. Discrimination, which is better understood within the social and community context based on the SDOH framework, is defined as a socially structured action that is unfair or unjustified and harms individuals and groups (Jones et al., 2009). Like other SDOH, discrimination has been cultivated and maintained by an interaction of social, economic, environmental, and political structures and policies (Jones, 2014; Ramírez & Lee, 2020), which existed before the pandemic and continue to influence today's social and community landscape.

Diminished Employment Opportunities

The covid-19 pandemic has also created severe employment and income impediments for persons of color with disabilities. Unsurprisingly, they have suffered the highest rate of job losses (Moen et al., 2020; National Disability Institute, 2020). In 2020, the jobless rates for those with disabilities who were Hispanic or Latino (16.8%), African American (16.3%), and Asian American (15.7 %) were higher than the rate for Whites with disabilities (11.6%) (Bureau of Labor Statistics [BLS], 2021). Research on past crises shows that not only are racial and ethnic minorities with disabilities more likely to lose their jobs, but also experience more significant challenges returning to work during recovery (Schneider, 2011). Even during periods of economic growth, they experience higher unemployment rates than Whites with disabilities. According to the SDOH perspective, social and economic factors (e.g., employment and income) have a greater influence on health than clinical care (Krist et al., 2020). Moreover, unemployment or losing a job can have several negative ripple effects such as eviction, loss of health insurance, and exposure to mental health vulnerabilities.

Community Living and Participation

The neighborhood and built environment (e.g., housing, transportation, workplace safety, and food availability) determines community living outcomes among a group of people. Various measures (e.g., social distancing, stay-at-home orders, teleworking) implemented to prevent the spread of COVID-19 have radi-

cally disrupted community living and participation arrangements and opportunities among all people. Multiply marginalized people of color with disabilities' independent living aspirations have particularly been disproportionately impacted because they are more likely to be unemployed, work in low-wage essential jobs, live in crowded neighborhoods that make it challenging to enact physical and social distancing, face accessibility barriers in obtaining relevant information, and experience limited transportation, among other barriers (Orsi et al., 2010; Price et al., 2013).

Health and Function

Healthcare deals with issues such as access to high-quality, culturally and linguistically appropriate, and health-literate care; access to insurance; and utilization of services (Jones, 2014; HHS, 2021). Plausibly, compared to their White counterparts, racial and ethnic minorities, including those with disabilities, are at a significantly higher risk of mortality and severe disease leading to some commentators calling "blackness" an underlying condition because the pandemic appears to disproportionately impact African Americans (Moore et al., 2020). Generally, they fare far worse than their White counterparts across an expansive range of health indicators and SDOH (Agency for Healthcare Research and Quality, 2019, Sarche & Spicer, 2020). For example, the 2018 National Healthcare Quality and Disparities Report indicated that from 2000 through 2016-2017 quality measures were worse for African Americans, Native Americans, and Pacific Islanders than Whites across 40% of quality indicators (Agency for Healthcare Research and Quality, 2019). Expectedly, communities of color tend to bear the greatest psychiatric morbidity burden during epidemics and natural disasters. For example, African Americans were reported to experience increased posttraumatic stress symptoms after Hurricanes Andrew (Novacek et al., 2020; Perilla et al., 2002) and more depressive symptoms after Hurricane Ike when compared to Whites (Davidson et al., 2013). Plausibly, people of color with disabilities are more likely to emerge out of the COVID-19 pandemic disproportionately burdened with mental health issues such as depression and anxiety as the crisis continues to ravage their communities. They may also experience increased mental illness due to historical trauma exacerbated by COVID-19 related stressors. Historical trauma refers to multigenerational trauma experienced by a specific cultural, racial or ethnic group (Kirmayer et al., 2014; Williams-Washington, 2010).

Assistive Technology

Universal AT access is an essential part of human life that provides critical links to many opportunities, including but not limited to employment, community participation, and education (Borg et al., 2012; Ward-Sutton et al., 2020). COVID-19 has presented unique AT challenges for individuals with disabilities (Moore et al., 2020). For example, while teleworking might open increased employment opportunities for people with disabilities, it may also place significant limitations that may affect their earning capacity, social interactions, and accumulation of social capital. People of color with disabilities, specifically are at higher risk of not having access to adequate AT devices, given that they have a documented history even pre-COVID-19 of experiencing multiple barriers such as denied access to AT funding sources (Borg et al., 2012; Carey et al., 2004; Ward-Sutton et al., 2020).

Rationale

Despite widespread consensus that people of color with disabilities appear to be at greater risk of contracting the disease and to die from it, it is unclear what kind of information is available in the literature about the challenges they face and strategies that can help improve employment, health and function, and community living and participation outcomes. Because of this severe lack of information, the field cannot ascertain where knowledge gaps exist. Accordingly, there is an urgent need for evidence synthesis to inform guidelines and interventions, especially at the early stages of a pandemic. In this unprecedented crisis, the World Health Organization (WHO) recommends rapid reviews (Pan et al., 2020) to provide foundational knowledge that can be used mitigate its effects. Therefore, a scoping review was conducted to map out the research done about people of color, including those with disabilities, as well as identify existing gaps in knowledge in this area. Federal agencies (e.g., NIDILRR and NIH), researchers, disability advocates, equity experts, state-vocational rehabilitation agencies (SVRAs) and other stakeholders could use the findings to inform policy decisions, research priorities, and practice interventions. To our best knowledge, this is the first scoping analysis in this area.

Method

Study Design

A scoping review methodology was implemented to explore current studies, provide a broader preliminary picture of the existing literature's scope, and identify knowledge gaps in the literature (Arksey & O'Malley, 2005; Godfrey et al., 2013; Grant & Booth, 2009). Scoping reviews are a useful approach for reviewing evidence rapidly in emerging fields or topics (e.g., COVID-19 among people with disabilities). Scholars (e.g., Godfrey et al., 2013; Khalil et al., 2020; Peters et al., 2015) have stated that scoping literature review is appropriate for reviewing areas of study that

are complex or have not been examined before. The five-stage methodological model for scoping review developed by Arksey and O'Malley (2005) was used.

Stage 1: Identify the research question

In this review we focused on the relevant disability/health and rehabilitation issues related to COVID-19 among people of color, including those with disabilities. The following broad research question guided the study: What is known from the existing disability/health and rehabilitation literature about COVID-19 among people of color, including those with disabilities? The objectives of this scoping review were three-fold:

- 1) Map out the characteristics, topics, and knowledge gaps about people of color, including those with disabilities.
- 2) Provide directions for further applied and methodological research that advance the disability/health and rehabilitation field.
- 3) Provide recommendations for advancing policy and practice interventions.

Stage 2: Identify relevant studies

A three-step search strategy was utilized in this study. First, we undertook an initial limited search of PubMed, NARIC REHABDATA, and Science Direct followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe articles. A second search using all identified keywords was undertaken across all included databases. We used a combination of keywords and concepts "COVID-19 or Coronavirus" combined with "racial minority", "ethnic minority", "African American/Black", "Hispanic", "Latinx", "Native American", and "Asians and Pacific Islanders", and "disability status". Thirdly, we conducted manual searches of reference lists of eligible studies and relevant review articles. From eligible studies, data were extracted to summarize and make a narrative account of the findings.

Stage 3: Study selection

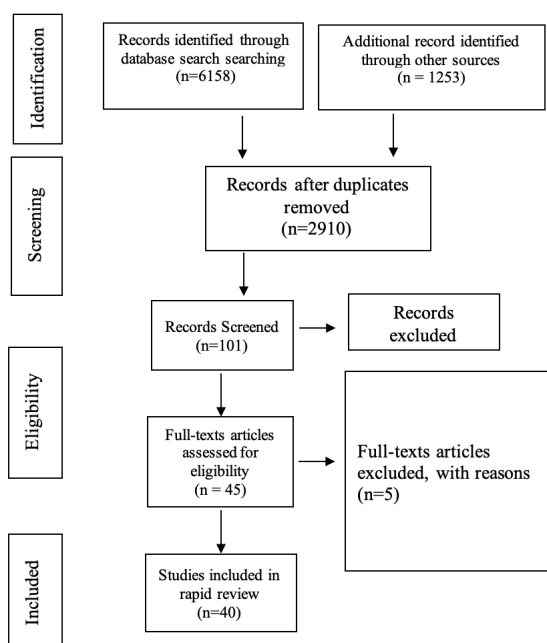
To be included in the review, papers needed to address people with disabilities and/or without disabilities from racial and ethnic backgrounds in the U.S., focus on COVID-19 pandemic, and be written in English language. Any paper that failed to establish this association was excluded, even if any of the listed characteristics were mentioned. The review considered articles (published and unpublished) and grey literature produced between January 20, 2020 (when the first case of COVID-19 was reported in the US) and April 10, 2021. Quantitative, qualitative, mixed-method, and conceptual articles were included in order to consider any methodological gaps. Papers were excluded if they did not fit into the purpose of the study. Editorials, newspaper articles and other forms of popular media were excluded. Papers talking about frameworks for COVID-19 vaccination distribution were also included. The study selection process included modifying inclusion and exclusion criteria as new ideas emerged during the process of gathering and reviewing information. The PRISMA flow chart (Figure 1) shows the selection process.

Stage 4: Chart the data

The fourth stage of the review included organizing the data from the selected articles. A data-charting form was jointly developed by two reviewers to determine which variables to extract.

Figure 1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram for the scoping review process



The collected data included author(s), title, publication year, research methods, and key findings. The two reviewers independently charted the data, discussed the results and continuously updated the data-charting form in an iterative process.

Stage 5. Collate, summarize, and report the results

Consistent with scoping reviews best practices (Arksey & O’Malley, 2005), consultation among research team members was ongoing as this approach should include the review and input of experts in research. Two researchers independently scrutinized the preliminary review results and identified themes. They utilized a thematic analysis approach that included open coding, memo writing, and constant comparison of data. Separately, the two researchers identified a total of 19 themes, which were then merged resulting in ten themes. Disagreements were resolved via mutual discussion involving the researchers who were involved in selecting studies and themes. Further, the draft was shared with other members of the team for further review and feedback. Based on the feedback two themes were merged resulting in nine themes.

Results

Our initial literature search terms identified a total of 7,411 records from databases and grey literature. After reviewing the titles and abstracts, 101 articles were selected. After screening at full text level, 61 were excluded. Of this total, 34 were eligible for study inclusion after removing duplicates. Most of the eligible studies (n = 24, 70.58%) were quantitative, followed by conceptual papers (n = 8, 23.52%), while 2.94% (n = 1) were qualitative, and 2.94% (n = 1) was a systematic review. Although the number of articles reporting COVID-19 among people of color has increased since the first case was reported in the U.S., the proportion of studies focusing on individuals with disabilities from racial and ethnic backgrounds was severely limited. Based on the categories from the scoping literature review content, the following themes were observed: disproportionate burdens of infections, hospitalizations, and deaths; structural racism as a driver of inequity during the COVID-19 pandemic; diminished employment opportunities; misinformation and mistrust; COVID-19 hesitancy and uptake; COVID-19 framework for federal agencies; reductions in life expectancy; protection of minority racial/ethnic healthcare workers; and limited data by race and disability. The identified themes were compared across the articles for further discussion. Table 1 provides a summary of articles reviewed.

Disproportionate Burdens of Infections, Hospitalizations, and Deaths

Nine studies reviewed revealed that people of color experience disproportionate burdens of infections, hospitalizations, and deaths from SARS-CoV2. One paper (Goldstein & Atherwood, 2020) documented that age-and-place adjusted COVID-19 death rates were 80% higher for African Americans and more than 50% higher for Hispanic or Latino, relative to Whites. One retrospective cohort study (Rentsch et al., 2020) that included 5,834,543 individuals receiving care in the US Department of Veterans Affairs found that African American and Hispanic/Latino veterans were more likely to test positive for COVID-19 and experienced an excess burden of SARS-CoV-2 infection compared to Whites. The findings could not entirely be explained by underlying medi-

Table 1
Methodological approaches, study titles, and key findings

Author(s)/Year	Study type	Title	Key findings
Abdillahi et al., (2020).	Quantitative (Cross-sectional study)	Assessment of community-level disparities in coronavirus disease 2019 (COVID-19) infections and deaths in large US metropolitan areas.	In more-poverty counties, those with substantially non-White populations had an infection rate nearly 8 times that of counties with substantially White populations
Ahmad et al., (2021).	Quantitative (Cross-sectional study)	Provisional mortality data—United States, 2020	Limited availability of testing for SARS-CoV-2
Andreasen & Goldman, 2021	Quantitative	Impact of COVID-19 on 2020 US life expectancy for the Black and Latino populations.	Reduction in life expectancy for Black and Hispanic populations
APM Research Lab Staff (2020).	Quantitative	The color of coronavirus: covid-19 deaths by race and ethnicity in the U.S.	Racial and ethnic minorities had the highest actual COVID-19 mortality rates
Benjamin, G. C. (2021).	Quantitative	Health inequity from the founding of the freedmen’s bureau to COVID-19.	Inequities in disease burden and access to care experienced by racial and ethnic minorities
Chandler, 2021	Qualitative	The impact of COVID-19 among Black women: evaluating perspectives and sources of information	Confusion, misunderstanding, and mistrust of the information received about COVID-19.
Chen et al., 2021	Quantitative	COVID-19 and the unequal surge in mortality rates in Massachusetts, by city/town and ZIP code measures of poverty, household crowding, race/ethnicity and racialized economic segregation.	Hispanic food/agriculture workers, African American retail workers, and Asian American healthcare workers experienced a 59%, 36%, and 40% increase in mortality, respectively
Deaton et al., 2020	Quantitative	The role of race, religion, and partisanship in misinformation about COVID-19	Minorities and highly religious individuals hold substantially greater number of misperceptions
Egbert & Liao, 2020	Conceptual	The Color of Coronavirus: 2020 Year in Review	All populations of color experienced higher nationwide death rates in 2020 than White Americans
Gaynor & Wilson, 2020	Conceptual	Social vulnerability and equity: The disproportionate impact of COVID-19	Existing disparities exacerbate COVID-19 outcomes for Black people
Gemelas et al., 2021	Quantitative	Inequities in employment by race, ethnicity, and sector during COVID-19.	Dramatic declines in number employed occurred in racial minorities
Goldstein & Atherwood, 2020	Quantitative	Improved measurement of racial/ethnic disparities in COVID-19 mortality in the United States	Age-and-place-adjusted COVID-19 rates are higher for Blacks and Hispanics relate to Whites. No disparity for Asians
Golstaeck et al. (2021).	Quantitative	The association of race and COVID-19 mortality	Blacks had a higher mortality with COVID-19 incompletely explains by other variables
Grandjean, 2020	Conceptual	Systemic racism, chronic health inequities, and COVID-19: A syndemic in the making	The pandemic exposed and magnified inequities. A need exists for a framework for understanding COVID-19 and guide research
Hawkins, 2020	Quantitative	Differential occupational risk for COVID-19 and other infection exposure according to race and ethnicity	People of color, especially Black workers, were more likely to be employed in essential industries and in occupations with more exposure to infections
Holmes et al. (2020)	Quantitative Data simulation & Cross-sectional design	Black-White risk differentials in COVID-19 (SARS-CoV2) transmission, mortality and case fatality in the United States: translational epidemiologic perspective and challenges.	Blacks/AA have a disproportionate burden and increased risk of COVID-19 mortality compared to their White counterparts.
Kocopa-Mandia et al. (2021).	Quantitative	Assessment of COVID-19 hospitalizations by race/ethnicity in 12 states.	Considerable disparities in the prevalence of COVID-19 across racial/ethnic subgroups of the population in 12 US states
Krieger et al., 2020	Quantitative	US racial/ethnic data for COVID-19 cases: still missing-in-action.	Inadequate data on race and ethnicity for US COVID-19 cases
Liao and DeMaio, 2021	Cross-Sectional Study	Association of social and economic inequality with coronavirus disease 2019 incidence and mortality across US counties	Confirmed positive associations of incidence and mortality rates with racial/ethnic composition and with income inequality well as a joint association incidence and mortality with both structural factors
Malik et al., 2020	Quantitative	Determinants of COVID-19 vaccine acceptance in the US	Black Americans reported lower influenza vaccine uptake and lower COVID-19 vaccine acceptance than all other racial groups
McClure et al., 2020	Conceptual	Racial capitalism within public health—how occupational settings drive COVID-19 disparities	Racial capitalism operating within public health system
Moen et al., 2020	Quantitative	Disparate Disruptions: Intersectional COVID-19 Employment Effects by Age, Gender, Education, and Race/Ethnicity, Work, Aging and Retirement.	Young women at increased of being unemployed and being out of the workforce. Black men aged 20–29 with a college degree more likely to be not in the labor force
Munoz-Price et al, 2020	Quantitative	Racial Disparities in Incidence and Outcomes Among Patients With COVID-19	Positive COVID-19 tests were associated with Black race, male sex, and age 60 years or older. Black race and poverty were associated with hospitalization

cal conditions or where they lived or receive care. Another study (Karaca-Mandic et al., 2021) examining COVID-19 hospitalizations in 12 states, which was published in JAMA Internal Medicine, found that the percentage of hospitalizations among African American patients exceeded the percentage of their representative share in each respective state’s population. The same study found that Hispanic or Latino were overrepresented in 10 of 11 states that reported number of COVID-19 hospitalizations. Although hospitalization data for Native Americans were only reported by 8 states, the disparity was substantial in states such as Arizona where they accounted for 15.7% of the hospitalizations but only 4.0% of the state’s population (Karaca-Mandic, et al., 2021). Three studies found that people of color experience higher excess deaths associated with COVID-19 compared to Whites (Chen et al., 2020; Chen et al., 2021; Rossen et al., 2020).

Recent data from APM Research Lab’s Color of Coronavirus project, which documents lives lost to COVID-19 by racial and ethnic group, revealed that people of color experienced higher nationwide mortality rates in 2020 than Whites (Egbert & Liao, 2020). Native American, African American, and Hispanic or Latino were at least 2.7 times more likely to die of COVID-19 than Whites. Similarly, Pacific Islanders were 2.3 times more likely to die of the disease than their White counterparts (Egbert & Liao, 2020). Liao

and De Maio (2021) conducted a cross sectional study and found a relationship between racial/ethnic composition and COVID-19 incidence and mortality. Specifically, they reported that a higher level of African American or Hispanic/Latino composition in a county was associated with a higher COVID-19 incidence and mortality; a higher level of economic inequality was also associated with a higher level of incidence and mortality. Golestaneh and colleagues (2020) found a significant increase in African American mortality risk from pre-COVID to COVID periods, which could not be fully explained by age, multiple reported comorbidities, and available metrics of sociodemographic disparity. One systematic review article found African American and Asian American patients to be at increased risk of death compared to White patients (Pan et al., 2020). Unfortunately, there was no study (n = 0) that focused on identifying burdens of infections, hospitalizations, and deaths among individuals with disabilities from communities of color.

One study found that testing positive for COVID-19 was associated with being African American (Muñoz-Price et al., 2020). The same study found that among patients with COVID-19, both race and poverty were associated with higher risk of hospitalization. However, only poverty was associated with higher risk of intensive care unit admission. Holmes et al. (2020) assessed COVID-19 data on confirmed cases and deaths by selective states health departments using a cross-sectional ecologic design. Their finding indicated that African Americans represented 34% of the total mortality in the U.S, although they accounted for 13% of the population size. The COVID-19 case fatality (CF) was higher among African Americans relative to Whites in several states such as Maryland, (2.7% vs. 2.5%), Wisconsin (7.4% vs. 4.8%), and Chicago (5.9% vs. 3.2%) (Holmes et al., 2020).

Structural Racism as a Driver of Inequity During the COVID-19 Pandemic

Seven articles reviewed identified structural racism (sometimes referred to as systemic racism) as the main driving factor of the disproportionate impact of COVID-19 among African Americans and other diverse racial and ethnic populations. It is important to note that most studies could not be exclusively allocated to one theme. For example, inquiries (e.g., Holmes et al., 2020) that reported racial differentials in SARS-COV2 transmissions, mortality, and morbidity also identified systemic racism as a major contributing factor to the differentials.

Of the seven articles, only one (Sabatello et al., 2021) identified the need to address the lingering health needs and long-term disability among people of color with disabilities. The authors called for culturally-sensitive responsive and multilevel approaches designed to dismantle historical wrongs perpetuated by decades of segregation, racism and structural discrimination. Four articles identified racial capitalism (McClure et al., 2020; Pirtle, 2020) or systemic racism (Gaynor & Wilson, 2020; Gravlee, 2020) as a key cause of COVID-19 and a major driver of COVID-19 disparities (McClure et al., 2020). Pirtle (2020) argues that “racism and capitalism mutually construct harmful social conditions that fundamentally shape COVID-19 disease inequities” (p. 504). Gaynor & Wilson (2020), on the other hand, perceived racism as the architect of racial disparity, which has produced socially vulnerable

Table 1

Methodological approaches, study titles, and key findings

Author(s)/Year	Study type	Title	Key findings
National Academies of Sciences, Engineering, and Medicine, 2020	Conceptual	Framework for equitable allocation of COVID-19 vaccine.	Equitably allocate COVID-19 vaccine
National Disability Institute, 2020	Conceptual	Race, ethnicity and disability: The financial impact of systemic inequality and <i>intersectionality</i> .	Current health and financial challenges of COVID-19 have further widened the economic disparities for this population
Siddiqua et al., 2021	Quantitative	Latest data on COVID-19 vaccinations race/ethnicity	Black and Hispanic people are less likely than their White Counterparts to have received a vaccine, leaving them at increased risk
Nguyen et al., 2021	Quantitative	COVID-19 Vaccination Intent, Perceptions, and Reasons for Not Vaccinating Among Groups Prioritized for Early Vaccination—United	Younger adults, women, non-Hispanic Black Adults, adults living in nonmetropolitan areas, and adults with less education and income, and without health
Nguyen et al., 2020	Quantitative	Risk of COVID-19 among frontline health-care workers and the general community: a prospective cohort study	Racial/Ethnic minority frontline workers reported increased Risk for SARS-COV-2 infection
Painter et al., 2021	Quantitative	Demographic Characteristics of Persons Vaccinated During the First Month of the COVID-19 Vaccination Program - United States, December 14, 2020- January 14, 2021	Inadequate data making it difficult to make conclusion
Pan et al., 2020	A systematic review	The impact of ethnicity on clinical outcomes in COVID-19: a systematic	Black, Asian and Minority Ethnic (BAME) individuals are at an increased risk of acquiring COVID-19 infection compared to White individuals and also experience worse clinical outcomes
Pirtle, 2020	Conceptual	Racial Capitalism: A Fundamental Cause of Novel Coronavirus (COVID-19) Pandemic Inequities in the United States	Racial capitalism causes health inequities associated with COVID-19
Ronotech et al., 2020	Quantitative (Retrospective Cohort Study)	Patterns of COVID-19 testing and mortality by race and ethnicity among United States veterans: A nationwide cohort study	Black and Hispanic individuals are experiencing an excess burden of SARS-CoV-2 infection
Rogers et al., 2020	Quantitative	Characteristics associated with hospitalization among patients with COVID-19—Metropolitan Atlanta, Georgia,	COVID-19 mortality was higher among non-Hispanic (NH) Blacks compared with NH Whites, due to more NH Blacks holding essential worker positions
Toner et al., 2020	Conceptual	Interim framework for COVID-19 vaccine allocation and distribution in the United States	Identifies groups that should be prioritized. Racial and ethnic groups are not directly identified as priority group for vaccine allocation.

communities through policies such as redlining and gentrification. One study (Hawkins, 2020), which used data about employment in 2019 by industry, occupation, and race and ethnicity obtained from the BLS found that people of color were more likely to be employed in essential industries and in occupations with more exposure to infections and proximity to others (Hawkins, 2020). Specifically, the study revealed that African Americans in the workforce faced a higher risk for infections and proximity to others. The investigators concluded that occupational segregation into high-risk industries and occupations likely contributes to differential risk with respect to COVID-19. Gravelle (2020) suggested the use of syndemic theory as a useful framework for understanding the COVID-19 pandemic in the U.S.

Diminished Employment Opportunities

Six studies showed people of color were experiencing unprecedented high levels of unemployment and slow rates of job recovery during the pandemic. One study found that African Americans, Asian Americans, and Hispanics experienced dramatic declines in employment during the pandemic (Gemelas et al., 2021). The greatest declines appeared in the Hispanics and Asian American frontline and African American non-frontline groups when compared to the referent groups and stratified by sector. The U.S. Department of Labor reported that the unemployment rate for people with a disability more than doubled from 7.8% in January 2020 to 18.9% in April 2020. The unemployment rate for this population declined from 18.9% in April 2020 to 12.5% in September 2020, but remained higher than the 7.8 percent recorded in January. On the other hand, the unemployment rate for people without a disability rose from 3.8% in January 2020 to 14.3% in April 2020. The unemployment rate for workers without a disability declined from 14.3% in April 2020 to 7.5% in September 2020, but remained higher than the 3.8% recorded in January 2020. It should be noted that in 2020, the prevalence of disability continued to be higher for African Americans and Whites than for Hispanics and Asian Americans (BLS, 2020). One study found that African American men aged 20–29 with a college degree experienced a 12.4 percentage point increase in being out of the labor force for reasons (NILF-other) other than retirement or disability (Moen et al., 2020). The same study found that COVID-19 unemployment increases were most dramatic among Hispanics and African American women, and Asian American and Hispanic men without a college degree. Moreover, the study found that a large proportion of women, especially Hispanics and Asian American women, were moving out of the labor force for unknown reasons during COVID-19 (Moen et al., 2020). A BLS report documented that the jobless rates in 2020 for Hispanics (16.8%), African American (16.3%), and Asians (15.7 %) with a disability were higher than the rate for Whites (11.6%) (BLS, 2021). The National Disability Institute (2020) reported that between January and May 2020, African Americans with disabilities suffered the highest rate of losses. Specifically, of the estimated 3.3 million working age African Americans with disabilities, 750,000 were employed and at-work in January. However, by April of the same year, 44% were no longer working. Similarly, 22% of Hispanics with disabilities lost their jobs between January and April. In comparison, 20% of all workers with disabilities were out of work in May. This disparity, although not surprising, reveals the unique challenges faced by multiply marginalized people of color with disabilities in the

context of the COVID-19 sequelae (National Disability Institute, 2020).

Misinformation and Mistrust

One unpublished working paper found that people of color, especially African Americans, exhibited significantly higher levels of misinformation (i.e., not having the right fact-based information) and lower levels of correct information relative to Whites (Druckman, 2020). The study also indicated that those with high levels of religiosity and those with strong partisan identities showed significantly higher levels of misinformation than those with contrasting group affiliations. One qualitative study involving 15 African American women as key informants reported that most of them (79%) expressed confusion, misunderstanding, and mistrust of the information that they were receiving about COVID-19 (Chandler et al., 2021). One literature review reported that only 18% of African Americans and 40% of Hispanics trust that a COVID-19 vaccine will be effective. The review identified mistrust of the medical and research enterprise among minority groups, which arises from the well documented history of medical exploitation of African Americans.

COVID-19 Hesitancy and Uptake

There is growing interest in understanding COVID-19 vaccination, which began in December 2020 in the U.S. Ensuring equitable COVID-19 vaccine access remains a national priority. Three articles reviewed found that vaccination nonintent (defined as not intending to receive a COVID-19 vaccination) or hesitancy was highest among African Americans (Malik et al., 2020; Nguyen et al., 2021; Szilagyi et al., 2021). One study published in Elsevier reported that compared to White non-Latino participants in the U.S., vaccine hesitancy was highest among African American participants, followed by Hispanics, Asian Americans, and participants reporting more than one race/other (Nguyen et al., 2021). Another study (Szilagyi et al., 2021) conducted between November 25 and December 8, 2020, found that the likelihood of getting COVID-19 vaccination was lower among African American than White individuals (38% and 59%, respectively). Malik et al. (2020) reported that African Americans experienced lower COVID-19 vaccine acceptance rates than all other racial groups in their study. Unfortunately, we did not find any study that reported vaccination intent or uptake among people with disabilities from racial and ethnic minority backgrounds. To address this gap, there is urgent need for studies designed to understand COVID-19 vaccine hesitancy among people of color with disabilities and develop models that can be used to increase vaccine uptake.

COVID-19 Framework for Federal Agencies

We found three frameworks that have sought to provide the federal government direction on how to address COVID-19 among people from communities of color. Of these, only one, which is titled, *Forecasting COVID-19 Issues for People of Color with Disabilities While Advancing the Minority-Serving Institution Research Capacity Building Science: A Framework for Federal Agencies* (Moore et al., 2020), specifically focused on multiply marginalized persons of color with disabilities. Information collected from a national listening session that included federal agency policy makers, researchers, faculty members at minority-serving institutions and predominantly White institutions, and other

stakeholders was used to inform the construction of this framework. The background mirrors a national COVID-19 applied disability/health and rehabilitation research and development (R&D) agenda that targets people of color with disabilities, and forecasts research capacity building needs and response strategies that empower minority-serving institutions to generate critical scientific and culturally appropriate knowledge to mitigate the effects of the pandemic and future disasters. The other two frameworks were developed by John Hopkins and NAS. They are: (a) Interim framework for COVID-19 vaccine allocation in the United States: Assisting policy maker, stakeholder and public deliberation (Toner et al., 2020) and (b) a framework for equitable allocation of COVID-19 vaccine (NAS; 2020). These two were included in the current study because they call for vaccination strategies that mitigate health inequities experienced by Americans, including people of color. Surprisingly, the two frameworks did not make specific reference to people of color with disabilities.

Reductions in Life Expectancy

One paper (Andrasfay & Goldman, 2021) examined the impact of COVID-19 in life expectancy in the U.S. The study forecasted that COVID-19 will reduce U.S. life expectancy in 2020 by 1.13 years. Specifically, estimated reductions for African Americans and Hispanics were 3 to 4 times that for Whites. The same inquiry projected that COVID-19 could reverse over a decade's progress that has been made in closing the African American–White gap in life expectancy. The researchers concluded that some reduction in life expectancy may persist beyond 2020 because of continued COVID-19 mortality and long-term impacts on SDOH such as employment, housing, and transportation (Andrasfay & Goldman, 2021).

Protection of Minority Racial/Ethnic Healthcare Workers

Three studies identified protection of minority racial/ethnic healthcare workers as one group greatly impacted by COVID-19. One study (Nguyen et al., 2020) conducted by Harvard Medical School researchers found health care workers of color were more likely to care for patients with suspected or confirmed COVID-19, more likely to report using inadequate or reused protective gear, and nearly twice as likely as their White colleagues to test positive. The researchers conducted a prospective, observational cohort study in the United Kingdom and U.S. focused on the general community, including front-line health-care workers, using self-reported data from the COVID Symptom Study smartphone application (app) from March 24 (UK) and March 29 (USA) to April 23, 2020. Another study (Rogers et al., 2020) found that COVID-19 mortality rates were higher among African Americans compared with Whites; due mainly to the point that the former are disproportionately represented in essential-worker positions. The study cited an intersection of longstanding systemic racism, structural inequalities and a lack of public policy aimed at protecting the lives of essential workers as responsible for racial disparities among essential workers in the U.S. One study used death records from the California Department of Public Health to assess excess mortality rates among Californians 18–65 years of age by occupational sector and occupation, with additional stratification of the sector analysis by race/ethnicity during COVID-19 pandemic (Chen et al., 2021). The findings indicated Hispanics food/agriculture workers, African American retail workers, and Asian

American healthcare workers experienced a 59%, 36%, and 40% increase in mortality, respectively. Yet, mortality among White food/agriculture workers increased by only 16%. In addition, the results showed that relative excess mortality was highest in food/agriculture workers (39% increase), transportation/logistics workers (28% increase), facilities (27%) and manufacturing workers (23% increase). People of color, including those with disabilities, tend to be overrepresented in these occupations. The investigators called for protection of in-person workers through strict implementation of health orders in workplace settings and prioritization of COVID-19 vaccine (Chen et al., 2021).

Limited Data by Race and Disability

Three articles reported that racial and ethnic data for COVID-19 cases were not readily available (Kriger et al., 2020; Ndugga et al., 2021; Painter et al., 2021). For example, not all states and territories report demographic data on vaccine recipients to CDC. Moreover, even for those that reported data to CDC, the information may not be desegregated by race/ethnicity and disability because the laws in each state or territory dictate whether they can collect or report demographic variables (Painter et al., 2021). As of February 16, 2021, available data revealed that race/ethnicity was known for just over half (55%) of people who had received at least one dose of the vaccine. A majority of the vaccine recipients were White (63%). In comparison, only 9% were Hispanics, 6% were African American, 5% were Asian American, 2% were Native American, and <1% were Native Hawaiian or Other Pacific Islander, while nearly 14% reported multiple or other race. As of May 25, 2021, CDC reported that race/ethnicity was known for 56% of people who had received at least one dose of the vaccine. Among this group, nearly two thirds were White (62%), 14% were Hispanic/Latino, 9% were African American, 6% were Asian American, 1% were Native American, and <1% were Native Hawaiian or Other Pacific Islander, while 8% reported multiple or other race (Ndugga et al., 2021). An analysis of data on first vaccine doses administered during December 14, 2020 thru January 14, 2021, and reported to CDC by January 26, 2021 showed that people of color were among 6,706,697 (51.9%) whose race/ethnicity was known.

Unfortunately, a full disability demographic national profile of those vaccinated is not available. In addition, race/ethnicity was unknown or not reported for 6,222,052 (48.1%) persons initiating vaccination (Painter et al., 2021). The failure to timely collect and make available national, state, and county-level data disaggregated by race/ethnicity and disability makes it harder not only to fully understand the impact of COVID-19 (Rogers et al., 2020) among racialized people with disabilities, but also formulate and implement effective policies and interventions to mitigate its effects. Moreover, this lack of data could further perpetuate disparities at the intersection of race, disability, and COVID-19, and hinder pandemic management efforts. Policymakers should prioritize investment in public health capabilities (e.g., health IT infrastructure) to facilitate long-term COVID-19 monitoring as well as future pandemic preparedness. As indicated in Healthy People 2030 (Gómez et al., 2021; Ochiai et al., 2021), there is also an urgent need to increase the proportion of nationally representative, population-based surveys that include a set of questions that identify individuals with disabilities by race and ethnicity. According to

Healthy People 2030, this objective currently has research status, meaning it is a high-priority public health issue that doesn't yet have evidence-based interventions developed to address implications.

Discussion

Our review showed that African American, Hispanic/Latino, Native Americans, and Asian Americans and Pacific Islanders are experiencing disproportionate burdens of infections, hospitalizations, and deaths from SARS-CoV-2 (Golestaneh et al., 2020; Holmes et al., 2020; Karaca-Mandic et al., 2021; Muñoz-Price et al., 2020). The review also suggests that people of color are more likely than Whites to experience Long COVID because they are disproportionately impacted by the pandemic. Unless disability eligibility concerns are well addressed, long haulers with disabilities from diverse racial and ethnic minority backgrounds could face a multiplicity of challenges toward achieving equitable employment, health, and community participation outcomes. This was not surprising given well documented scientific and anecdotal evidence persistently showing that people of color have historically experienced long-standing intersectional and multiple layers of discrimination because of their race and ethnicity (Jones et al. 2009; Krishnan et al., 2020; Moore et al., 2015; Moore et al., 2020; Moore et al., 2021; Moore & Wang, 2016; NAS, 2003; NAS, 2016).

Structural racism (or systemic racism) also emerged as a common theme and was identified as the primary driver of the poor social determinants of health outcomes (e.g., employment, housing, education, food, healthcare, support systems) among people of color within the COVID-19 pandemic context and represents a barrier to health equity efforts. This condition has been cultivated and maintained by an interaction of social, economic, environmental, and political structures and policies (Jones, 2014; Moore et al., 2020; Ramírez & Lee, 2020), which existed before the pandemic and continue to influence current and future interventions. Scholars have argued that racism shapes multiple diseases that interact with COVID-19 to influence poor health outcomes and affect disease outcomes through increasing multiple risk factors for traditionally underrepresented racial and ethnic minorities and replicate historical patterns of inequities within pandemics (Pirtle, 2020). For multiply marginalized people of color with disabilities, various SDOH are likely to worsen during and after the crisis.

Structural racism against people of color with disabilities is not limited to individuals. The institutions (e.g., HBCUs, Tribal colleges and universities [TCUs]) that serve them also experience the heavy burden of systemic and structural biases such as underfunding and mischaracterization of the value of the knowledge they produce (Moore et al., 2012). For example, historically Black colleges/universities (HBCUs) are underrepresented in scientific knowledge production and innovation enterprises (Moore et al., 2012; Moore et al., 2021). Yet, data document that investigators of color are more likely than their White counterparts to focus their scientific and discovery efforts on disability, employment/rehabilitation, and health interplay issues that have a disproportionate impact on people of color with disabilities and their communities (Manyibe et al., 2017, Moore et al., 2012). Because structural racism is not self-implementing, it requires bold and intentional policy

initiatives and investments aimed at simultaneously creating new systems that promote health and rehabilitation equities and disincentivize racialized and other types of discrimination. Accordingly, COVID-19 policy, research, and practice responses should focus on identifying strategies for addressing historical sociocultural, economic, and political structures and policies that promote such inequalities, which in turn create conditions that facilitate entrenched race-based disparities (Moore et al., 2020). According to SDOH perspective, structural discrimination (residential segregation, variance in the implementation of criminal justice policy) drive disparities in access in many areas such as transportation, health care, and high-quality jobs (Jones, 2014; Ramírez & Lee, 2020).

Recognizing these inequalities, President Biden issued an Executive Order that requires federal governmental entities to allocate resources to address the historic failure to invest sufficiently, justly, and equally in underserved communities, as well as individuals from those communities (Exec. Order No. 13985, 2021). The edict provides federal agencies (e.g., National Institute on Disability, Independent Living, and Rehabilitation Research [NIDILRR] and National Institutes of Health [NIH]) a clear opportunity to innovate and direct investments to minority-serving institutions, especially those who have been historically underrepresented as grantees in the federal research enterprise. However, given the ephemeral nature of executive orders, a need exists for permanent legislative driven immediate and long-term actions aimed at dismantling and replacing systems that perpetuate and reproduce structural racial inequalities.

Diminished employment and earning opportunities for people of color was a major theme that has a major impact on other SDOH among people of color with disabilities. Research on past crises shows that they are more likely to lose their job and experience more significant difficulties returning to work during recovery (Schneider, 2011). Even during periods of economic growth, they face higher unemployment rates than Whites. As job losses worsen due to pandemic, it is highly predictable that people of color with disabilities will continue to disproportionately experience massive job losses and find it difficult to return to work post-pandemic. These findings demonstrate unequal effects of COVID-19 on employment and income status across racial and ethnic groups. In addition, they demonstrate how structural racism has further affected people of color through differential employment loss during the onset of the pandemic (Gemelas et al., 2021). According to the SDOH perspective, social and economic factors (e.g., employment and income) have a greater influence on health than clinical care (Krist et al., 2020). Unemployment or losing a job can have ripple effects such as eviction, access to health insurance, and vulnerability to mental illnesses. Therefore, it is imperative that targeted immediate and long-range strategic research, policy, and practice actions are taken to ensure timely responses that mitigate disparate race-based disparities in employment outcomes during and post-pandemic.

Our results identified several major scientific knowledge gaps. First, research focused on multiply marginalized people of color with disabilities within the context of COVID-19 pandemic is very limited. For example, disability data are missing for nearly

all COVID-19 cases and deaths. In addition, although the CDC reports demographic characteristics, including race/ethnicity of people receiving COVID-19 vaccinations at the national level, it does not report the disability status of those receiving vaccinations. Lack of data disaggregated by disability and race can have serious negative implications (Holmgren et al., 2020) such as perpetuating existing social and economic inequities, leading to poor and disjointed policy formulation and implementation decisions, and poorly designed and/or biased practice interventions. Second, CDC is not providing comprehensive federal, state, and local level demographic data for people vaccinated thus making it difficult to both understand the impact of COVID-19 on multiply vulnerable groups and guide employment, community living, and health public policy interventions. Moreover, the existing data is not always easily available for use by capacity building and public health equity researchers. This undermines the integrity of COVID-19 data and makes it difficult for researchers, especially those based at minority-serving institutions and organizations that serve minority racial and ethnic groups to participate in conducting relevant applied research that can be used to inform culturally competent interventions designed to improve the social determinants of health among people of color with and without disabilities. The Foundations for Evidence-Based Policymaking Act of 2018, which includes the Open, Public, Electronic, and Necessary Government Data Act (OPEN Government Data Act) provides federal agencies an opportunity to ensure that detailed disability status, and racial and ethnic demographics are at the core of any federal data governance infrastructure. To prevent mistrust and hesitancy in vaccine uptake, among others, it is critically important that the office of the Chief Data Officer of the agency and composition of the Data Boards reflect the racial and ethnic diversity of the nation to minimize the perception and emerging conspiracies that data are manipulated to achieve politically motivated aims.

A final gap in the current scientific state of knowledge within the pandemic context is that very few studies have examined the employment, health and function, and community participation experiences and outcomes of people of color with disabilities. Lack of empirical knowledge regarding how COVID-19 impacts this target population can lead to the “see nothing, hear nothing, and do nothing” attitude among policy makers, practitioners, researchers, and other decision-makers, which would effectively entrench and accelerate existing disparities. Therefore, a critical need exists for culturally competent scientific studies that examine short-term and long-term effects of COVID-19 on employment, community living, and health and function among people of color with disabilities and how differential outcomes can be improved to achieve equity.

Our review shows that trust in science and misinformation about COVID-19 is a major issue among African Americans and other minority populations. Mistrust arises from the well documented history of medical exploitation of African Americans, Indigenous Native American communities, and disability communities as well as experiences of racism and discrimination within health care system (Benjamin, 2021; Toner et al., 2020; Williams-Washington, 2010). The COVID-19 pandemic has highlighted the importance of understanding complex political, social, and behavioral factors influencing public acceptance of effective,

scientifically rigorous, and ethically sound recommendations to reduce transmission, including future vaccine acceptance (Dube et al., 2021). Lack of trust and misinformation can hinder health service seeking behaviors and thus perpetuate existing disparities in several SDOH. Alsan and Brook (2020) argued that mistrust can lead to hesitation in seeking medical care, following health advice or consenting to experimentation and thus poses a major barrier to curtailing COVID-19. However, mistrust in science or vaccine hesitancy should not be seen as irrational or “anti-science”; rather it often reflects legitimate doubts and concerns about vaccines (Dube et al., 2021). What may be needed is a multifaceted collaboration strategy that involves local actors such as faith-based organizations, community-based organizations, and minority-serving institutions such as HBCUs. For example, HBCU-based researchers could be tasked with coordinating research that is aimed at developing models for providing COVID-19 services and improving research and surveillance infrastructure capabilities at minority-serving institutions. Meaningful collaborations can create a foundation of trust to promote coordination both in foundational areas and during crisis situations (DeSalvo et al., 2021).

COVID-19 long haulers (sometimes referred to as Long COVID, COVID-19 syndrome, post-COVID syndrome and post-acute COVID-19 syndrome) is an area that has recently received increased attention among scientists, policy makers, disability advocates, and healthy inequity experts (Carvalho-Schneider, 2020; Huang et al., 2021). Long-haulers are those who continue to experience symptoms several weeks or months past infection (Carvalho-Schneider, 2020; Huang et al., 2021; NIH, 2021). Despite emerging evidence of long haulers, we did not find any study that has examined this phenomenon among people of color with disabilities. Long COVID could have serious employment, community living, and health and function implications for this population, which is disproportionately impacted by the disease. For instance, COVID-19 long haulers may have unique needs (e.g., accommodations and assistive technology) to help them realize their full potential. In the short term, policy makers and disability service providers should work together to ensure that disability eligibility barriers for long-haulers from communities of color are eliminated. In the intermediate and long-term, researchers, including those based at minority-serving institutions, should study the Long-COVID phenomenon to inform new policies or update existing ones, and offer best practices guidance for practitioners and service consumers.

Role of Minority-Serving Institutions in the Context of Pandemics

One innovative approach to deal with COVID-19 and emerging pandemics is to involve minority-serving institutions, especially those who have been underrepresented as grantees, in the federal R&D enterprise. There is a long history of not fully involving minority-serving institutions, especially HBCUs and TCUs, in the scientific discovery and dissemination of knowledge enterprise (Moore et al., 2012). This means, for example, that they seldom contribute to assigning meaning to diseases, how evidence is solidified, and which data is prioritized (Callard & Perego, 2021). Consequently, their underrepresentation is increasingly linked to a cascade of suboptimal outcomes and experiences among people of color with disabilities in employment, health, and community

participation outcome domains (Moore et al., 2012; Moore et al., 2015; National Institute on Disability and Rehabilitation Research [NIDRR], 2011). To eliminate longstanding inequalities and inequities that COVID-19 has exposed, we need contributions made by those closest to the problem. For instance, minority-serving institutions, which are mostly located in communities impacted the most by COVID-19, should be at the forefront of conducting robust biomedical studies designed to document evidence-based strategies for addressing COVID-19 topics such as misinformation, vaccine hesitancy, and trust deficits in science among people of color with disabilities who are at increased risk for infection, morbidity, and mortality due to long-standing systemic social and economic inequities. In their seminal study investigating barriers to HBCU participation in the federal disability and rehabilitation R&D enterprise, Moore and his colleagues issued a “call to action” to NIDILRR and NIH to develop new policy initiatives that situate MSIs as pivotal players in advancing the science about crises disproportionately impacting communities of color (Moore et al., 2012; Moore et al., 2020) such as the COVID-19 pandemic.

Limitations

The scoping review approach has several limitations. First, this review did not evaluate the quality of the evidence. Generally, scoping reviews do not formally assess this variable as the objective is often to rapidly gather information from a wide range of study designs and methods. Second, because this research technique provides a descriptive account of available data, this often leads to broad, less defined searches that require multiple structured strategies focused on alternative sets of themes. Moreover, this review was limited by scope and content due to limited data about these foci targeting people of color with disabilities in the context of COVID-19.

Conclusion

There are serious evidence gaps relating to multiply marginalized people of color with disabilities in the context of COVID-19 pandemic. For example, most studies about people of color do not mention those with disabilities. These gaps have several research, policy, and practice implications. To fill this void, there is a need for more research about rates of infections, hospitalizations, outcomes, and deaths disaggregated by disability and race, among other factors, so that the field has a fuller understanding of the impact of the disease on people of color with disabilities. Currently, investments to address the SDOH remains the primary intervention to ensure that people of color with disabilities realize their full potential (Moore et al., 2020). The SDOH affect employment, health, community living and participation outcomes among people of color with disabilities, and ultimately their quality of life and lifespan (Artiga & Hinton, 2018; Holmes et al., 2020). The SDOH framework can help untangle and address social, economic, and political mechanisms that generate inequalities in society. However, to fully address current complex equity challenges among multiply people of color with disabilities, NIDILRR and other stakeholders (e.g., grantees, people with disabilities) should develop and implement a new equity framework to guide policy, research, and practice actions needed to bring about holistic systemic changes leading to improved employment, community living, and health

outcomes. Our findings can be helpful in informing national, state, and local level public policy, practice, and research interventions designed to mitigate the calamitous effects of the pandemic.

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A Scoping Review of Opioid Use Disorder Treatment Barriers and Telehealth for African Americans with Disabilities in Rural Communities

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This article provided a comprehensive overview of challenges that African Americans with disabilities residing in rural areas often face in the United States when accessing telehealth treatment to mitigate opioid misuse. A scoping literature review was conducted focusing on this target population, telehealth, disabilities, opioid treatment, and rural healthcare systems. Systematic searches on eight electronic databases were carried out in line with the study's aims. The results identified treatment benefits and advantages, expansion challenges, and multi-cultural considerations for telehealth delivery. There may be a need to increase rehabilitation research in this area to inform needed changes in policies and practice.

Keywords: *Rural, Barriers, Access, Telehealth, African Americans with disabilities, Opioid Use Disorder*

The opioid epidemic in the United States (U.S.) has disproportionately impacted rural communities where mortality rates due to their misuse have surpassed that of urban areas (Centers for Disease Control and Prevention [CDC], 2017; Knopf, 2018). Interestingly, rural communities experience higher incidences of overdose related deaths involving natural and semi-synthetic opioids such as oxycodone, hydrocodone, morphine, and codeine (CDC, 2018; Scholl et al., 2019). This phenomenon could be attributed to the fact that rural residents often have less specialty treatment resources than their counterparts in urban communities (Kertesz & Gordon, 2019; Palombi et al., 2019). Opioid Use Disorder (OUD) is defined as a development of dependency and

chronic use of opioids that is likely to cause impairments in the major core areas of functioning in an individual's life and characterized by continued use despite personal, relational, and professional disruptions (American Psychiatric Association, 2013; Dydik et al., 2021). The current crisis has a compact effect on rural communities at large, impacting quality of life, economic growth, and rural prosperity (Rigg et al., 2018).

The African American community has borne the brunt of this calamity, accounting for a whopping 21% increase in mortality rates compared to the overall population (James & Jordan, 2018). According to the U.S. Center for Disease Control and Prevention (2019), 1 in 4 members of this target population possesses a disability. African Americans are frequently prescribed medication due largely to managing chronic pain, mobility limitations, pain, and complications related to mental health disorders (U.S. Department of Health and Human Services [HHS], 2019; Washington-Walker et al., 2017). Those with mental health disorders have

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high co-morbid with substance use disorder (SUD) (Evans et al., 2020; Hooker et al., 2020). Opioids are the commonly misused substance among this group, with approximately 4.7 million individuals within the U.S. having both a disability and OUD (HHS, 2019). OUD is “a chronic relapsing disorder that, whilst initially driven by activation of brain reward neurocircuits, increasingly engages anti-reward neurocircuits that drive adverse emotional states and relapse” (Strang et al., 2020, p. 1). African Americans have also experienced the highest increase in demise due to overdose involving synthetic opioids (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020; Spencer et al., 2019).

To alleviate the deleterious implications of opioid misuse on African Americans residing in rural communities, additional earmarked resources may be needed to support wrap-around prevention, treatment, and recovery service efforts (Myers et al., 2017; Palombi et al., 2019). These programmatic resources should address fundamental systemic and long-standing treatment and outcome disparities that have caused them to remain vulnerable to the national opioid predicament. The development of specialty treatment in rural areas is likely to occur through the advancement of facilities, support, and equipment, such as hospitals, mobile treatment clinics, residential facilities, transitional housing, workforce development, strategic planning, community planning, medical and safety equipment, and equipment for telehealth and distance learning (Au-Yeung et al., 2019; Egan, 2019). Programmatic development and community-level interventions may vary based upon cultural and communal needs. African American rural residents with disabilities present distinctive barriers to accessing specialized OUD treatment and resources to rectify the impact of the crises.

Research has indicated many barriers to treating OUD in rural communities, suggestions have been made to increase programmatic strategies for the prevention and treatment of OUD (Ali et al., 2020; Letourneau, 2021; Lister et al., 2020). Rural communities still require a concerted effort to build effective OUD treatment programs, as a lack of resources and programs to provide services to persons who struggle with substance misuse, specific tailored strategies as rural communities present with specific needs and barriers (Havens et al., 2018). Rural community leaders should identify evidence-based practices (EBP) that would be the most effective for their community characteristic, as direct connection to the community is important in guiding the efforts of treating OUD (Letourneau, 2021). Creating statewide opioid crisis plans across state healthcare offices would be useful in guiding these efforts, as this would expand rapid access to opioid treatment (Ali et al., 2020). Current barriers for rural communities are commonly identified as a lack of clinics and providers to provide specialty treatment (Lister et al., 2020). Another common barrier are negative attitudes of OUD or substance misuse by providers while rendering services (Lister et al., 2020). Other accessibility barriers have been identified as being related to travel, costs, and time constraints (Beachler et al., 2021). Stigma and community attitudes have also created significant barriers, as many do not consider OUD as an illness that is imperative to treat (Beachler et al., 2021). Rural communities are in need of services that provide prevention and education, as well as improved collaborative capacity with healthcare systems across the state.

Innovative interventions that help eradicate treatment access barriers are warranted to address this emergency within African American disability and rural context. One such technological solution that could address the unmet demand for specialized care and providers in rural settings is telehealth. This advanced platform is utilized to disseminate health and medical information, as well as deliver direct health care services via remote telecommunication methods such as video conferencing (Barash, 2019; Capon et al., 2016; Dorstyn et al., 2013; Eibl et al., 2017). Telehealth has a proven track record as an innovative and well-versed application of healthcare practice, demonstrably effective in easing provider shortages in rural areas (Gates & Albertella, 2016; Klein & Anker, 2013). A review of the literature indicates that telehealth services have been helpful in reducing hospitalizations and facilitating improved medication adherence, symptom reduction, and treatment (Ben-Zeev, 2014; Holmes et al., 2019; Hubbard et al., 2007). This method perhaps embodies a promising, powerful application for OUD treatment for rural African American residents with disabilities by providing them access to needed treatment (George et al., 2009, 2012; Forducey et al., 2012; Saberi et al., 2013). Telehealth enables the delivery of services to rural clients that include intensive and frequent monitoring, early detection of symptoms, monitoring of medication and treatment compliance, promoting disease knowledge, and patient education (Schopp et al., 2006).

Currently there is a dearth of knowledge on telehealth and treatment access barriers among rural residents who are African Americans with disabilities experiencing OUD. The rural setting presents unique characteristics and challenges that manifest poor service access and treatment (Lister et al., 2021). The delivery of service interventions via telehealth could resolve intersectional factors such as transportation issues, loss of productivity, time management, and employment and help to reduce treatment stigma; all of which represent concerns among African Americans with disabilities. This scoping review sought to assemble current evidence about access barriers to OUD treatment via telehealth among members of this target population. The study objectives were to:

- (1) Explore studies in the extant published and grey literature containing benefits and advantages of telehealth that could be considered for application in treating OUD among African American rural residents with disabilities.
- (2) Identify non-clinical and clinical challenges that restrict adoption of telehealth across rural healthcare systems serving target population members.
- (3) Identify multicultural considerations that impact their accessibility to telehealth treatment services.

Methods

The PRISMA framework was utilized to conduct the scoping review methodology to explore existing studies, synthesize knowledge of the topic, and identify gaps in the literature. The review allowed for the incorporation of a broad range of qualitative and quantitative studies to be reviewed and synthesized. This approach also provided the research team an opportunity to review a broad range of the literature to examine the extent and nature of available research (Davis et al., 2009). A scoping study is used to undertake

and examine the extent, range, and nature of research activity to determine and clarify a complex concept and refine future research on emerging topics and evidence (Tricco et al., 2018). Scoping literature reviews are particularly relevant to rehabilitation science, in which there is a paucity of research and randomized controlled trials in emerging topics, which makes it difficult to undertake systematic reviews (Tricco et al., 2018). There is a scarcity of literature and studies related to the topic of African American rural residents with disabilities in regards to access to OUD and telehealth treatment, in which a scoping literature review would be ideal, as this model provides an opportunity to generate findings that complement the findings of clinical trials, as well as intervention effectiveness within the healthcare literature and research (Davis et al., 2009).

Search Strategy

All articles relevant to the objectives were explored and reviewed by research team members using the following databases: PubMed, Academic Search Premiere, EBSCOhost, psychINFO, ProQuest Library, and government documents and reports (U.S. Census Bureau, U.S. Centers for Disease Prevention and Control, and Substance Abuse and Mental Health Services Administration. A combination of keywords were used in each database. The following keywords were included in the search: telehealth, telerehabilitation, African Americans, disability, OUD, opioid misuse, opioid crisis, healthcare disparities, rural communities, African Americans with disabilities, challenges, barriers, and accessibility. Figure 1 depicts the scoping review paradigm.

Selection Process

Articles and studies related to the objectives and keywords published between 2002 and 2020 were selected, and those that discussed the advantages and benefits of telemedicine and telerehabilitation were also included within the review. Policy briefs reporting on clinical opioid needs of the targeted community population were included. Government documents and reports were utilized to outline telehealth as a healthcare solution for the opioid crisis. There was difficulty in finding a variety of specific empirical studies that highlighted African American consumers' experience and perspective of telehealth. There was one specific article that highlighted the perspective of African Americans within the urban community. Due to the scarcity of studies and articles related to the objectives, this article was not excluded. Documents reporting on healthcare disparities within OUD treatment were included in the analysis to understand the necessity of telehealth to alleviate barriers and disparities. An overview of this process using the PRISMA flowchart is provided in Figure 1 in the appendix. To increase the consistency among the reviewers, all of the same 36 publications and results were discussed and screened by the research team. The titles, abstracts, and full context of the publications were evaluated for potential relevancy. In total 800 publications were screened by the research team. Approximately 95 publications were eliminated upon the full text being reviewed. Two studies were conducted outside of the U.S., in Canada and Brazil, and so, there are no major implications for the U.S. population in the conclusion. These publications were used to justify the effectiveness of telehealth in treating OUD and co-morbid mental health disorders. There were in total 20 quantitative studies, 13 literature reviews, and 3 qualitative studies. To be included in the review, publications needed

to measure the effectiveness of telehealth, African Americans with disabilities in rural communities receiving telehealth treatment, specifically for OUD, barriers and gaps within rural communities in treating OUD. Papers were excluded if they did not fit into the conceptual framework of the study, which focused on telehealth OUD treatment in rural communities.

Results

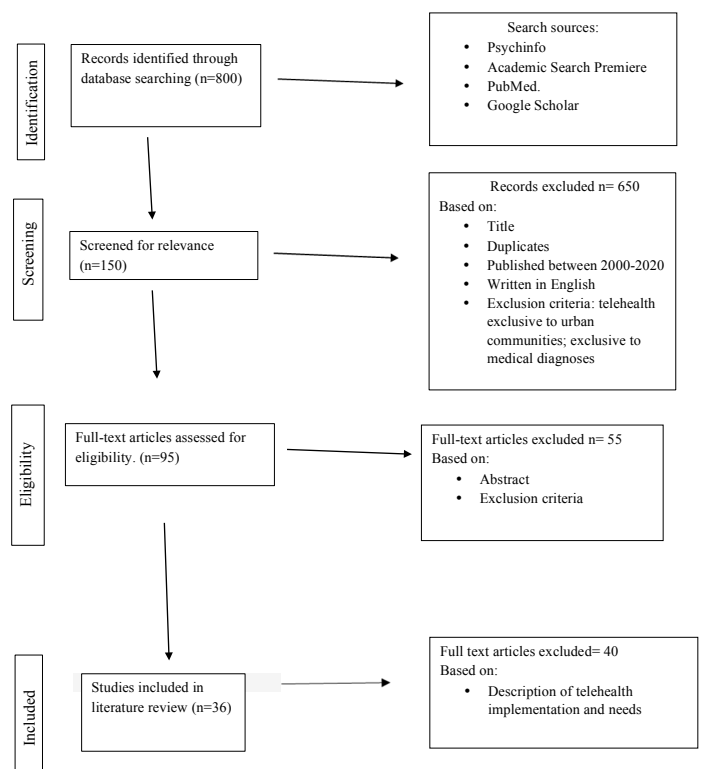
In total 36 papers were included in this scoping review of the literature. Most of the papers were developed in the United States. Two of the papers were developed outside of the U.S., (Eibl et al., 2017; Fernandes et al., 2010). These papers were developed in Brazil and Ontario, Canada. The implications and conclusions for this study were included in the review due to meeting the criteria of examining telehealth effectiveness in treating opioid and substance misuse compared to traditional face-to-face modality. All documents are grouped into the following three categories to provide an overview of the literature Figure 2 depicts the results and exerts of the publications included in the framework:

- Category 1: Benefits and advantages of telehealth OUD treatment services
- Category 2: Challenges towards expansion and adoption
- Category 3: Multicultural considerations of telehealth for African Americans

Category 1: Benefits and Advantages of Telehealth Treatment (n = 26)

This category explored the feasibility and effectiveness of various forms of telehealth in addressing clinical OUD and mental health treatment needs. Category 1 also highlighted how telehealth is a solution to health disparities within the rural U.S. communi-

Figure 1: PRISMA for source selection



ties. Acosta et al. (2017) explored the promise of web-based services for symptomatic combat veterans with post-traumatic stress

syndrome (PTSD) and hazardous substance use. This study developed and evaluated a web-based tool targeting three primary outcomes, which were PTSD, heavy drinking and drug use, and quality of life. The results indicated that PTSD symptoms or quality of life did not have significant treatment effects. However, treatment effect was significant for heavy alcohol use and positive impact on social support, self-efficacy, increasing coping, and hope for the future. Bickel and colleagues' (2013) article reviewed the status of technology-based delivered SUD treatment and made suggestions for future directions. They reviewed status in three contextual factors that included enhancing opportunity, importance, and timeliness of the use of such technological interventions for treating SUD. Authors recommended that technology delivered SUD treatment needed to be empirically examined to determine ways to expand, extend, and reorganize interventions to be integrated into hybrid telehealth modalities.

Figure 2: Results of individual sources of evidence

Study title	Category/Importance	Excerpt
Bickel et al., (2013)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	Reviewed status in three contextual factors that included enhancing opportunity, importance, and timeliness of the use of such technological interventions for treating SUD. Authors recommended that technology delivered SUD treatment needed to be empirically examined to determine ways to expand, extend, and reorganize interventions to be integrated into hybrid telehealth modalities.
Dicianno et al. (2015)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	Reviewed the evolution of mobile health and its application to the rehabilitation process for optimizing patient satisfaction, delivery of care and promotion of health and wellness. This article sites regulatory and funding issues as barriers to the application of mobile health to rehabilitation.
Dorstyn et al., (2013)	1: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	Reviewed the evidence for tele-counseling effectiveness in managing depression among minority populations. concluded that the short-term treatment effect was associated with tele-counseling for managing depression. Moderate to large improvements for depression, quality of life, and psychosocial functioning were reported in the study.
Gates & Albertella (2016)	1: Effectiveness of telehealth, and its impact on substance use and mental.	Systematic review of the literature about tele-counseling and illicit drug and alcohol use treatment. The meta-analysis assessed the effectiveness of mobile telephone delivered contingency management interventions in promoting abstinence, medicine adherence, and treatment engagement.
Gilmore et al., (2017)	Establishing the rationale for further investigation and research inquiry. health treatment.	Reviewed 601 articles to determine the efficacy of technology-based designs to improve mental health and substance use treatment outcomes. They concluded that more work is needed to assess efficacy using rigorous scientific studies, establishing the rationale for further investigation and research inquiry.
Fernandes et al. (2010)	1: Effectiveness of telehealth, and its impact on substance use and mental health treatment. Clinical trial in Brazil to evaluate telephone brief motivational interviewing in marijuana consumption and cessation.	conducted a clinical trial in to evaluate telephone brief motivational interviewing in marijuana consumption and cessation. Authors reported that telephonic intervention had a positive impact on marijuana consumption cessation, as 73% of the participants were abstainers, and 59% ceased use of marijuana all together.

Dicianno et al.'s (2015) paper reviewed the evolution of mobile health and its application to the rehabilitation process for optimizing patient satisfaction, delivery of care, and promotion of health and wellness. This article sites regulatory and funding issues as barriers to the application of mobile health to rehabilitation. Another challenge identified was the affordability of smartphones whereas the authors suggested an option of providing lower cost smartphones to increase the utilization of mobile health. Dorstyn and colleagues (2013) article reviewed the evidence for telecounseling effectiveness in managing depression among minority populations using the Oxford Center for Evidence Based Medicine guidelines. The review included a final sample of eight independent studies with a sample of 498 adult participants of Asian, African American, and Latinx origin. They concluded that the short-term treatment effect was associated with tele-counseling for managing depression. Moderate to large improvements for depression, quality of life, and psychosocial functioning were reported in the study.

Gates and Albertellas (2016) paper was a systematic review of the literature about tele-counseling and illicit drug and alcohol use treatment. The meta-analysis assessed the effectiveness of mobile telephone delivered contingency management interventions in promoting abstinence, medicine adherence, and treatment engagement. A total of 94 publications were included in their analysis. The authors concluded that the literature was supportive of tele-counseling in that it has efficacy for alcohol use, and that treatment outcomes are better for individuals who received the mobile delivered intervention. Gilmore and colleagues' (2017) reviewed 601 articles to determine the efficacy of technology-based designs to improve mental health and substance use treatment outcomes. They concluded that more work is needed to assess efficacy using rigorous scientific studies.

Eibl et al. (2017) study compared treatment outcomes for traditional face-to-face services compared to opioid

agonist therapy (OAT) via telemedicine. This was a non-randomized cohort comparison investigation that included 58 clinics across Ontario, Canada. The results showed that patients were more likely to be retained in OAT via telemedicine than their counterparts in traditional face-to-face (50% compared to 38%). The authors concluded that telemedicine is an effective alternative to face-to-face treatment, with a potential to expand access and care for rural, remote, and urban communities. Fernandes et al. (2010) conducted a clinical trial in Brazil to evaluate telephone brief motivational interviewing in marijuana consumption and cessation. Groups were randomly divided into experimental and minimal intervention treatment groups. Authors reported that telephonic intervention had a positive impact on marijuana consumption cessation, as 73% of the participants were abstainers, and 59% ceased use of marijuana all together.

A systematic literature review was conducted by Holmes et al. (2019) assessing the current state of the literature on treatment via telecommunications for individuals with depression and substance use. The review found that mobile devices and internet services assist in increasing access to mental health and substance use services. Authors recommended that longitudinal and large-scale studies be conducted to standardize telehealth practice in this arena. Final results also documented improved therapeutic alliance and increased client engagement and satisfaction via telehealth treatment. Forducey et al. (2012) highlighted three pilot studies on the utilization of telecommunications to deliver healthcare services, promote self-care, enhance healthcare, and management of health for caregivers of individuals with severe functional disabilities. This article concluded that there is a lack of clear evidence to establish the efficacy of telecommunications. Future investigations were recommended to determine the role of telecommunications as an intervention for this target population. Another study conducted by Hubbard et al. (2007) examined the feasibility and efficacy of follow up phone calls to 399 patients who were discharged from four short-term inpatient residential treatment programs. The results indicated that the patients who received follow up calls were more likely to have outpatient treatment adherence.

Gates and Albertella (2016) reported in a systematic review of literature that short-term telephone counseling was accepted as an alternative delivery method within 94 publications. Still, another meta-analysis (i.e., Getty et al., 2019) assessed evidence of effectiveness for telephone contingency management intervention to promote abstinence from substance use. Findings indicated that the telephone intervention was effective for treating alcohol and tobacco users, but not for those with SUD. Schopp et al. (2006) reported similar results in an article where developments in telehealth and cutting-edge technologies within rural communities were reviewed. Authors concluded that overall telecommunication interventions showed considerable promise in addressing dis-

parities, as well as improving the quality and access to healthcare. According to the authors, telecommunications are a proficient and

Figure 2: (Continued)
Results of individual sources of evidence

Study title	Category/Importance	Excerpt
Holmes et al. (2019)	1: Effectiveness of telehealth, and its impact on substance use and mental health treatment. Literature review on current state in telehealth and mental health and substance use treatment.	assessing the current state of the literature on treatment via telecommunications for individuals with depression and substance use. The review found that mobile devices and internet services assist in increasing access to mental health and substance use services.
Huskamp et al (2018)	2: Challenges in Expansion and Adoption of Telehealth.	Reviewed the database of large commercial insurers to determine the utility of tele-substance treatment. They reported that despite the increase of tele-substance use treatment, there was an overall decline and low utilization in the technology.
Eibl et al. (2017)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment	compared treatment outcomes for traditional face-to-face services compared to opioid agonist therapy (OAT) via telemedicine. The results showed that patients were more likely to be retained in OAT via telemedicine than their counterparts in traditional face-to-face (50% compared to 38%).
Forducey et al. (2012)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	highlighted three pilot studies on the utilization of telecommunications to deliver healthcare services. This article concluded that there is a lack of clear evidence to establish the efficacy of telecommunications. Future investigations were recommended to determine the role of telecommunications as an intervention for this target population
Hubbard et al. (2007)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	examined the feasibility and efficacy of follow up phone calls to 399 patients who were discharged from four short-term inpatient residential treatment programs. The results indicated that the patients who received follow up calls were more likely to have outpatient treatment adherence
Gates & Albertella (2016)	1A: Effectiveness of telehealth, and its impact on substance use and mental health treatment.	a systematic review of literature that short-term telephone counseling was accepted as an alternative delivery method within 94 publications. Findings indicated that the telephone intervention was effective for treating alcohol and tobacco users, but not for those with SUD.
Higgins (2019)	2: Challenges in Expansion and Adoption of Telehealth.	highlighted the critical importance of changing healthcare behaviors to address health disparities. This article emphasized the policy and research needs of health care. Author suggested that activity should promote health related behavioral changes within the clinical infrastructures to address opioid treatment needs in rural communities.

Continued on page 79

effective method of treatment for rural residents with chronic illness. In a review of a qualitative study involving 13 key informants (i.e., caregivers, consumers, and spouses), Shulver et al.

(2017) reported that telerehabilitation service delivery was more convenient, motivating, and improved therapeutic relationships.

Saberi and colleagues (2020) carried out an investigation to describe the relationship between mental health, substance use services, and medication adherence among youth ages 18-29 living with HIV. A total of 29 interviews were conducted to identify barriers. Results revealed that adherence was negatively associated with mental health measures, such as trauma, depression, adverse childhood experiences, and cannabis/stimulant use. Key informants indicated a preference for technology use in treating mental health and substance dependence. Santa Ana et al. (2013) explored the feasibility of a telehealth management program for veterans with substance use disorders in an outpatient program. Findings revealed that telehealth is feasible as an adjunct and stand-alone treatment for targeted population. A similar study (i.e. Saberi et al., 2013) assessed the feasibility and acceptability of telehealth medication counseling intervention in addressing disparities of low treatment adherence and engagement for African American youth living with HIV. Results indicated that telehealth innovation was feasible and acceptable among participants, and that the use of this technology led to more disclosure of treatment difficulties, increased patient comfort, and improved health education. Molfenter and colleagues (2018) assessed the interest and usage of telemedicine application across 363 SUD treatment centers and organizations. The results yielded suggested that future studies should highlight specific organizational behaviors and needs towards adoption of technology for service delivery (Molfenter et al., 2018). Myers and colleagues surveyed 159 mental health staff to better understand perceived clinical video telehealth versus traditional face-to-face service efficacy differences. This article identified several barriers and recommended potential guidelines to expand the adoption of telehealth (Myers et al., 2017).

The effectiveness and feasibility of telehealth services were highlighted in an article (i.e., Lewis et al., 2017) that emphasized the limitations of research on tele-rehabilitation. The article concluded that the tele-rehabilitation model demonstrated much promise for delivering services to people with disabilities. Authors noted the need for a stronger evidence base to validate the effectiveness of this approach as demand and usage increase. Lin and colleagues (2019), in a systematic literature reviews, also examined interventions for SUD via videoconferencing (i.e., medication and psychotherapy treatment). The article concluded that out of 841 manuscripts, 13 met criteria and reported high patient satisfaction with telemedicine. Authors recommended that further studies examine different models and the need for integration into existing healthcare delivery settings. Klein and Anker (2013) analyzed administrative data use of web-based recovery support programs and compared post treatment alcohol use for patients in residential treatment. Findings support that computerized programs hold much potential for alcohol and drug depen-

Figure 2 (Continued)

Results of individual sources of evidence

Study title	Category/Importance	Excerpt
Huskamp et al (2018)	2: Challenges in Expansion and Adoption of Telehealth.	Reviewed the database of large commercial insurers to determine the utility of tele-substance treatment. They reported that despite the increase of tele-substance use treatment, there was an overall declination and low utilization in the technology.
Marsch et al. (2020)	2: Challenges in Expansion and Adoption of Telehealth.	article indicated that digital technology in assessing and treatment SUD is promising; however, science-based SUD service delivery models are needed to increase service capacity within healthcare. Authors suggested that the National Drug Abuse Treatment Network increase their science on digital health to highlight its potential for standardizing a delivery model.
Palombi et al. (2019)	2: Challenges in Expansion and Adoption of Telehealth.	evaluated telehealth outcomes in opioid and heroin use rural communities through nine forums held in the Northeast region of U.S. They found that telehealth increased awareness and community engagement.
Uscher-Pines et al., (2020)	2: Challenges in Expansion and Adoption of Telehealth. solidifies the need to establish the scientific evidence and standardization of this service delivery model.	noted that telehealth in the home of patients has emerged to address health disparities and highlights how structures of care impact growth and expansion.
Tillotson et al., (2015)	3: Multicultural Considerations of Telehealth.	Authors postulate that an allocentric approach is needed to address such inequities within behavioral health context. In this regard, a historical assessment of traumas that have led to mental illnesses among this community's members must be factored into account.
Cassity-Caywood (2019)	3: Multicultural Considerations of Telehealth. examined rural communities' specific concerns in mental health and substance use treatment.	Author identified technology as a major strength in addressing emerging public health issues such as the current opioid crisis; concluding that flexibility is needed to improve infrastructure and socioeconomic opportunities within rural communities.
George et al. (2012)	3: Multicultural Considerations of Telehealth.	Article identified confidentiality and privacy as issues among African American study participants. Their concern was that personal information shared via e-technology would be stolen or accessed by unauthorized individuals, and that internet and technology platforms are "insecure" and "for anybody."

Continued on page 80

dence treatment. Johnston et al. (2019) conducted a naturalistic study that examined whether a smartphone-based relapse prevention system improved retention of women with SUD in rural areas. Participants were mandated to treatment, and the findings indicate that the smartphone-based prevention system assisted with retention of 410 days versus 262 days. Gilmore et al. (2017) systematically reviewed 601 articles that examined technology-based intervention for consumers with co-occurring disorders. Preliminary results indicated that technology-based interventions were likely to be effective in reducing trauma and substance use symptoms. This review suggested that technology-based interventions are feasible, and more research is needed to access effect with rigorous scientific studies. Glueckauf et al. (2012), in a randomized controlled trial, compared the effects of traditional face-to-face and telephone based Cognitive Behavioral Therapy (CBT) services for caregivers of patients with dementia. Article concluded that both telephone and face-to-face treatment showed improvements in depression, subjective burdens, and support.

Category 2: Challenges in Expansion and Adoption of Telehealth (n=4)

This category explored issues and challenges to the adoption of telehealth as a model of delivery for health care systems. Higgins (2019) highlighted the critical importance of changing healthcare behaviors to address health disparities. This article emphasized the policy and research needs of health care. The author suggested that activity should promote health related behavioral changes within the clinical infrastructures to address opioid treatment needs in rural communities. These specific activities would assist in the expansion and adoption of telehealth as a modality of treatment for rural healthcare OUD clinics. Knopf (2018) explored state responses to the opioid crisis through SAMHSA sponsorships. This authors reported that telehealth has been funded to implement MAT for OUD services. Huskamp et al. (2018) reviewed the database of large commercial insurers to determine the utility of tele-substance treatment. The data was collected from calendar years 2010-2017 and included client characteristics, and ways in which tele-substance treatment was used in conjunction with traditional face-to-face services. They reported that despite the increase of tele-substance use treatment, there was an overall declination and low utilization of the technology. A recommendation was to monitor which delivery models are being used and their impact on access and treatment outcomes. Marsch et al. (2020) article indicated that digital technology in assessing and treating SUD is promising; however, science-based SUD service delivery models are needed to increase service capacity within healthcare. Authors suggested that the National Drug Abuse Treatment Network increase their science on digital health to highlight its potential for standardizing a delivery model. Palombi et al. (2019) evaluated telehealth outcomes in opioid and heroin use rural communities through nine forums held in the Northeast region of the U.S. They found that telehealth increased awareness and community engagement. Uscher-Pines and colleagues (2020) noted that telehealth in the home of patients has emerged to address health dis-

parities and highlights how structures of care impact growth and expansion. The recent increase in demand during the COVID-19 global pandemic solidifies the need to establish the scientific evidence and standardization of this service delivery model. New research findings could help effectively facilitate the adoption and utilization of telehealth services providers and African American rural consumers.

Category 3: Multicultural Considerations of Telehealth (n=6)

According to Tillotson et al. (2015), cultural worldview is an important prism for understanding and alleviating health disparities experienced by African Americans residing in rural communities. Authors postulate that an allocentric approach is needed to address such inequities within the behavioral health context. In this regard, a historical assessment of traumas that have led to mental illnesses among this community’s members must be factored into account. Cassity-Caywood (2019) examined rural communities’ specific concerns in mental health and substance use treatment. The author identified technology as a major strength in addressing emerging public health issues such as the current opioid crisis;

Figure 2: (Continued)
Results of individual sources of evidence

Study title	Category/Importance	Excerpt
George and Baker (2009)	3: Multicultural Considerations of Telehealth.	African American participants’ were the physical absence of physicians or specialists, limited ability to monitor specialists’ telemedicine qualifications, and use of technology and resulting privacy/confidentiality issues. They were also concerned about someone possibly stealing their identity, and their information “floating” around on the internet. Authors recommend tailored approaches to introduce and implement telemedicine services to African Americans, as their needs and concerns are indeed unique.
Williams and Wyatt (2015)	3: Multicultural Considerations of Telehealth.	article discussed racial disparities within healthcare practices rooted within historical institutionalized racism within the U.S. Authors mentioned how physicians and clinicians are unaware of racial biases that exist within the healthcare delivery system, and how a first step to rectifying biases is to enhance awareness about the pervasiveness of such race-based disparities.
Young et al. (2015)	3: Multicultural Considerations of Telehealth.	article also identified potential barriers to substance use recovery resources for consumers within rural areas. Article noted that access to treatment and other professional care, expansion of mental health care, and intensive referrals represented community barriers. Awareness of such challenges within the community should lead to collaborative problem solving whereby clients can potentially navigate issues by investing in the various stages of telehealth development.

concluding that flexibility is needed to improve infrastructure and socio-economic opportunities within rural communities.

While telehealth has shown promise in addressing health disparities among African Americans, George et al.'s (2012) article identified confidentiality and privacy as issues among African American study participants. Their concern was that personal information shared via e-technology would be stolen or accessed by unauthorized individuals, and that internet and technology platforms are "insecure" and "for anybody." Some participants felt that their identity could be possibly "floating around" and did not trust that their health information would be kept confidential. In terms of perceived advantages, they felt that telehealth increased immediate access to multiple medical opinions and reduced waiting times. George et al.'s (2009) article reflected similar telemedicine driven advantages for African Americans and Latinx but also noted differences in concerns. Benefits for both groups included immediate feedback to diagnosis and course of action, increased access to specialists, and increased access to multiple medical opinions. African American participants' concerns about telemedicine were the physical absence of physicians or specialists, limited ability to monitor specialists' telemedicine qualifications, and use of technology and resulting privacy/confidentiality issues. They were also concerned about someone possibly stealing their identity and their information "floating" around on the internet. Authors recommend tailored approaches to introduce and implement telemedicine services to African Americans, as their needs and concerns are indeed unique.

Telehealth services should be conceptually customized and designed prior to embedding within local clinics in rural communities, as marketing strategies should consider the needs and goals of this target population. Williams and Wyatt's (2015) article discussed racial disparities within healthcare practices rooted within historical institutionalized racism within the U.S. Authors mentioned how physicians and clinicians are unaware of racial biases that exist within the healthcare delivery system, and how a first step to rectifying biases is to enhance awareness about the pervasiveness of such race-based disparities. Increased commitment to acquiring skills that might help to minimize such inequalities were also a recommendation within this article. They also recommended that using White people as a reference for improving health should be considered as a non-effective response. Young et al.'s (2015) article also identified potential barriers to substance use recovery resources for consumers within rural areas. The article noted that access to treatment and other professional care, expansion of mental health care, and intensive referrals represented community barriers. Awareness of such challenges within the community should lead to collaborative problem solving whereby clients can potentially navigate issues by investing in the various stages of telehealth development. Investments were defined as tools that help alleviate issues such as the distance from resources for substance use dependent clients in rural area.

Discussion

This study was the first to examine in detail reported strategies to counteract the negative effects of the opioid epidemic on African Americans with disabilities residing in rural communities. The

following three objectives guided the analysis: (1) explore studies in the extant published and grey literature containing benefits and advantages of telehealth that could be considered for application in treating OUD among African American rural residents with disabilities (2) identify non-clinical and clinical challenges that restrict adoption of telehealth across rural healthcare systems serving target population members, and (3) identify multicultural considerations that impact their accessibility to telehealth treatment services. The review addressed each of these objectives and potentially position telehealth as a strategy that could help alleviate race-based behavioral health disparities in OUD treatment (Cuccicare & Timko, 2015; Gates & Albertella, 2016; Jackman et al., 2019). The detailed discussion that follows tracks each objective.

Advantages and Benefits of Telehealth Intervention

This review highlighted various telehealth advantages in alleviating specialty care shortages for OUD, mental health, and SUD treatment recovery services in rural communities. These advantages include the optimization of factors in healthcare improvement and the quality of care and client satisfaction increasing (Dicianno et al., 2015; Gates & Albertella, 2016; Glueckauf et al., 2012). Factors of improvement have been described as drug and alcohol use decreasing for clients, as coping skills increased for participants with reported mental health symptoms (Acosta et al., 2017; Dors-tyn et al., 2013; Gates & Albertella, 2016; Gilmore et al., 2017). Along with a decrease in substance use, telehealth has provided effectiveness in managing mental health symptoms (Acosta et al., 2017; Fernandes et al., 2010; Klein & Anker, 2013). A handful of included studies in this review saw telehealth as being an efficient alternative to traditional face-to-face services for rural residents who have a SUD (Getty et al., 2019; Klein & Anker, 2013). Services necessary for medical recovery and treatment of OUD (OAT and MAT) have been cited to be effective in a telemedicine platform (Eibl et al., 2017; Lin et al., 2019). Psychosocial factors and the quality of life have been cited to improve within telehealth treatment (Eibl et al., 2017; Lin et al., 2019).

Although telehealth has been appraised as a solution to the shortage of specialty providers in rural areas, there is a dearth of research available on its implementation within the rural healthcare system. Moreover, studies within this scoping review has indicated that research activity is limited concerning specific healthcare organizational practices and barriers of adopting telehealth as a modality of treatment (Gilmore et al., 2017; Molfenter et al., 2018). An increase in research would inform clinical/administrative practices and encourage policy changes that are necessary for full integration into health care practice. The growing popularity of technology in clinical practice over the past two decades emphasizes the increasing necessity of telehealth. Overall, the demand for telehealth services is presently more critical than they have ever been. The literature collectively concluded in this review that research activity should focus on standardizing telehealth practice so that a model could be adopted for healthcare systems.

Adoption and Expansion of Telehealth in Rural Healthcare

Rural health care settings are confronted with several challenges in providing convenient, specialized, and evidenced based practice services, particularly to African Americans (Hilty et al.,

2018). Although telehealth has contributed to alleviating service gaps, health disparities, policies, and regulatory systems have influenced its underutilization due to a mixture of reimbursement issues, uncertainty of interstate policies and practices, as well as, licensure restrictions (Jackman et al., 2019; Perry et al., 2020; Talbot et al., 2019; Uscher-Pines et al., 2020). Healthcare policy review and modification is critical to increase telehealth utilization among providers and clients. Recently, legislators, healthcare systems, and regulatory bodies have revised guidelines to encourage widespread utilization (Lerman et al., 2018). However, cohesiveness is needed to address interstate practice issues, and contemporary service delivery and payment models and practice guidelines are needed to promote adoption. A significant factor that has limited adoption of the telehealth practices in rural communities is the absence of private insurance-based reimbursement and Medicare and Medicaid benefits, although third party payers have begun to address this barrier within the past five years (Adams et al., 2018). Reimbursement standard practices, benefits, and risks should be cohesive and solidified, as current policies may vary from state to state causing uncertainty among providers and thus negatively impacting telehealth adoption. The Office of Medicare and Medicaid Services has revised policies over the years to assist with acceptance (Gilman & Stensland, 2013). The Benefit Improvement and Protection Act (BIPA) of 2001 represents a policy response intervention for alleviating over-regulation and payment. The mandate indicated that physicians receive 100% of their fee for services, and that fees for telehealth services should be equivalent to face-to-face services and not less than (Gilman & Stensland, 2013). Despite these efforts, telehealth service adoption for Medicare providers and beneficiaries remains modest (Uscher et al., 2020a, Uscher et al., 2020b).

Federally funded efforts have sought to better understand expenses and financial barriers to telehealth access in rural communities. Early project findings demonstrated that small agency and individual providers experienced financial difficulty in implementing telehealth practices (Adams et al., 2018; Gilman & Stensland, 2013). To address this issue, Adams and colleagues (2018) recommended that extra overhead cost associated with implementing telehealth should be revised within the Medicare and Medicaid payment and reimbursement model. Policy amendment efforts should standardize interstate regulations, as inconsistencies across states was cited as a barrier. Additional legislative factors that inhibit telehealth practices within rural areas should also be identified and addressed. Insurance panels' (i.e., private health care insurance, Medicaid and Medicare) perspectives are needed in conversations about adoption barriers and policy to increase and target available services.

Multicultural Consideration of Accessibility to Telehealth

The acuity and healthcare needs of rural communities are different than those within urban areas and require a different approach to address issues to accessibility among African Americans with disabilities experiencing OUD. Due to increased demand in rural areas, providers have been encouraged to apply creative techniques that enhance service convenience among residents. According to Schopp et al. (2006), implementation challenges include accessible designs, privacy and confidentiality, and reimbursement issues. George et al. (2012) reported similar findings on how Af-

rican Americans perceived technology issues with confidentiality and privacy as concerns.

There are a multitude of sociocultural and historical factors that impact health seeking behaviors of African American rural residents with disabilities. Among these factors are attitudes and patterns of beliefs towards illnesses, healing, and norms that govern participation in rehabilitation and healthcare services (Tillotson et al., 2015). African Americans' utilization of services has also been strongly associated with attitudes towards disabilities, expectations of services, and attitudes towards providers (Higgins, 2019; James & Jordan, 2018; Saberi et al., 2013). Those residing in rural communities are more likely than their counterparts in urban areas to experience poverty and live in segregated communities, which makes them more susceptible to provider to patient ratio disparity (Murry et al., 2011). Economic oppression in rural communities and historical experiences of racism, lack of institutional and employment services, as well as few mental health services are implications of service underutilization. Murray et al. (2011) suggested that the intersection of factors such as race and poverty chronically exposes African American rural residents to deprivation of resources and money, which could impact prognosis and engagement in health care and rehabilitation services. The author also postulated that African American residents living in poverty and rural areas are more likely to develop mental health disorders and substance use in young adulthood. Consequently, there is a need to better understand those with disabilities' needs that can be addressed via telehealth methods.

Limitations

The studies presented in this article represent a small and diverse body of work that highlighted areas that may need to be developed for enhanced telehealth adoption and expansion targeting African American rural residents with disabilities and OUD. As such, this current review presents translation restrictions since it reflects an applied research agenda starting point that will be eventually informed by a more mature peer reviewed literature base. Another limitation is that the quality of the studies was not analyzed or considered; they were selected from a wide range of investigations related to the research question and topic. Further, the inability to compare the groups across the studies was difficult due to the various operational definitions for OUD recovery, as well as telemedicine and telehealth.

Conclusion

This review examined the current literature about challenges faced by African American rural residents with disabilities in accessing OUD treatment via telehealth. What was unclear in the literature were specific barriers to telehealth services that they experience. Moreover, specific factors that could help promote the adoption of telehealth services targeting this population were also unclear. As such, the field faces challenges in standardizing a model for implementing telehealth services targeting this population, such as differential policies and procedures related to reimbursement and overhead costs, and a lack of cohesiveness in requirements across states lines. The standardization of this intervention

could perpetuate physicians, clinicians, and consumers to utilize this as a tool to promote access to recovery services.

Overall, there is a paucity of empirical data to govern effective and culturally tailored telehealth services. Moreover, specific accessibility barriers important to clinical practice and services are difficult to understand. Additional research in this area is needed for several reasons. First, the more we learn about telehealth issues, the more aware and better educated the field becomes about needed interventions that has a direct influence on treatment engagement. Adoption of telehealth depends upon understanding social constructs, such as, stigma, cultural factors, and anxiety towards this healthcare. Second, translational research could directly impact the utilization of OUD services via telehealth for target population members. Therefore, expansion of this topic is needed to effectively educate consumers of the overall benefits. Third, exploring the perspectives of consumers and professionals in rural communities could inform the development of new amendment policies and procedures that help create cohesiveness across state lines; thus, increasing telehealth adoption.

Implications

Future research should focus on rural healthcare providers' cultural awareness training needs and telehealth implementation. This agenda should consider cultural context across the scientific paradigm in translating telehealth adoption. The remaining research gaps on this topic are the identification of (a) barriers to telehealth substance use recovery services for African Americans with disabilities residing in rural communities experiencing OUD, (b) strategies that help members of this target population access telehealth-based OUD treatment, and (c) professional, policy, and licensure/training needs of rural healthcare delivery systems in adopting telehealth practices. Research in these areas is likely to increase the awareness of issues in accessing quality healthcare services for OUD. A review of rehabilitation healthcare policies and government documents would be beneficial in further understanding the administrative barriers that prohibit telehealth services in rural communities. Future research should gather the perspective of rehabilitation counselors and educators and African American rural residents with disabilities about practical benefits and barriers to implementing telehealth services. Telehealth has great potential in alleviating healthcare services barriers for African Americans with OUD and disabilities in rural communities and could also advance OUD prevention efforts via education and clinical interventions.

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Factors in Utilization of Telehealth Treatment by Rural African-Americans with Opioid Use Disorder and Disabilities

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This study explored factors that impact telehealth service utilization for treatment of African Americans with disabilities with opioid use disorder in rural communities. A focus group was conducted involving 12 different mental health, substance use, and rehabilitation counseling professionals. The analysis was completed using NVivo (Version 12). The results identified critical barriers that included historical distrust of technology and healthcare systems, digital divide/unavailability of Internet modems, fear of losing confidentiality, and agency non-approval. The benefits were improved communication, reduction of stigma, continuity of care, and convenience of collaboration. The findings indicate the need for additional research in this topic area.

Keywords: *Rural, Barriers, Access, Telehealth, African Americans with Disabilities, Opioid Use Disorder*

Understanding barriers to access and successful outcomes among African Americans with disabilities has been an explicit focus of rehabilitation research since the adoption of Section 21 of the Rehabilitation Act Amendments of 1992. However, to date there has been limited attention given to rural African-American residents with disabilities, specifically those with opioid use disorder (OUD), in accessing and utilizing tele-

health treatment in order to achieve such outcomes. Access to effective treatment has been a long-range goal of the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) since the agency established priorities for research aimed at enhancing the field's understanding of effective services authorized by the Rehabilitation Act of 1973 (NIDILRR, 2018).

Telerehabilitation or telehealth is a relatively new modality that has been added to the treatment landscape in recent years. The COVID-19 public health emergency brought an unprecedented change and advancement of health care, federal and state health

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care systems rapidly changed their delivery of services, as many assessments and treatment protocols changed to an online format (Drake et al., 2020; Oesterle et al., 2020; Zhou et al., 2020). During the recent global pandemic (COVID-19) many substance use and mental health clinics decreased their traditional face to face contacts, which widened the treatment gap for African Americans in rural communities with OUD (Drake et al., 2020; Gruber, et al., 2020; Oesterle et al., 2020; Zhou et al., 2020). Telehealth assessment and treatments contained all elements as a face to face visit would encompass (Drake et al., 2020). Many aspects of treatment changed for individuals coping with OUD in which aspects such as access to laboratory services for urine testing became difficult (Oesterle et al., 2020). Many studies began exploring the strategies and monitoring of substance use and mental health treatment, but few discussed the access of rural African American residents with OUD. This recent pandemic has presented an opportunity to use technology to advance and improve the quality of health care, as well as further research to be conducted within rural community health care systems (Drake et al., 2020; Gruber et al., 2020; Oesterle et al., 2020; Zhou et al., 2020).

Maximizing the health and functioning of rural African-American residents with disabilities and OUD is a critically important foci, as this population is at great risk of poor health outcomes due to inadequate access to healthcare and functional limitations, which negatively impacts full participation in employment and community living (NIDILRR, 2018). Furthermore, due to elevated health risks, adverse outcomes and substantive needs, persons with disabilities still experience poor access to healthcare services (NIDILRR, 2018). The capacity to meet the healthcare needs of persons with disabilities in rural communities encompasses developing and advancing rehabilitation research, service delivery, and treatment strategies. Specialized treatment and resources are a necessity for rural African-American residents with disabilities and OUD (George et al., 2012; Hilty et al., 2018; James et al., 2017).

The World Health Organization (WHO) describes barriers as being more than just physical. For example, some barriers are described as negative attitudes towards people with disabilities, as well as, services, systems, and policies that limit or prohibit their inclusion (WHO, 2011). Literature has emphasized that several barriers to specialized care for rural residents are transportation and providers trained in specialized healthcare (Gilmore et al., 2017; Jackman et al., 2019; Johnston et al., 2019; Klein & Anker, 2013; Lin et al., 2019; Molfenter et al., 2018; Smith & Kelly, 2002; Titus & Guthmann, 2010; Usher-Pines et al., 2020; Young et al., 2015).

Telehealth services have been recognized within the literature as being an effective and innovative solution to alleviating these healthcare barriers. Substance use treatment and interventions, such as cognitive behavioral therapy (CBT) delivered using telehealth modalities have demonstrated the same amount of effectiveness as face-to-face services (Arndt et al., 2021; Khatri et al., 2014). Although telehealth treatment services have shown to be effective, there are still general concerns regarding limited access for rural African-American residents with disabilities. Many of these concerns are related to regulations and policy standards that

vary by state (Keyes et al., 2014; Lerman et al., 2018) and impact telehealth treatment services implementation.

Issues with implementation shown that there are unique barriers and needs to consider while adopting telehealth as a service delivery model and strategy in disability settings. Although there is an abundance of RSA-911 data analyzing racial and ethnic differences in treatment outcomes, such data are void regarding telehealth services and practices. There is also a need to increase understanding via research of what directly impacts access and utilization of OUD treatment delivered via telehealth to rural African-American residents with disabilities.

Apart from general concerns of rural access to telehealth for many groups, there is a more specific concern for cultural considerations that may hinder this population from utilizing these services. For example, historically, African Americans have displayed a distrust towards formalized healthcare systems and treatment. Some of this apprehension is related to unethical medical research practices historically and the lack of culturally relevant interventions (Sun et al., 2016; Tillotson et al., 2015). These aforementioned researchers and others have documented a myriad of factors that impact African Americans' full participation in substance use disorder (SUD) treatment.

Currently, there is a dearth of knowledge and empirical data pinpointing and emphasizing the specific needs and concerns of rural African-American residents with disabilities and OUD, as evidenced by limited studies in the extant literature on this topic. Also, having more data on the efficacy of telehealth as a treatment modality generally is imperative towards creating and testing culturally competent and responsive interventions within rural healthcare systems, and especially those focused-on OUD treatments for minority populations. To decrease barriers of access for this population, it is critical to understand the specific needs from a rural, disability, and culture-specific perspective. Relatively little information is known about the efficacy of culturally relevant telehealth services for persons with disabilities and OUD living in rural communities. The lack of knowledge in this area must be limiting the profession's ability to strategically plan and implement services among this population of consumers. Lack of knowledge also limits the development of a culturally responsive telehealth model for OUD that could enhance disease management and treatment success.

Researching the cultural relevancy of a telehealth model for OUDs could ultimately move in the direction of more effective OUD treatment outcomes for rural African-American residents with disabilities. As such, the purpose of this study was to discover the factors (barriers and benefits) to the utilization of OUD treatment via telehealth services for rural African-American residents with disabilities. This study intended to understand those factors (barriers and benefits) as they pertain to utilization from the perceptions of clinical services professionals. Research questions were derived from literature regarding accessibility and utilization for rural communities in deploying telehealth delivered healthcare services. The following research questions were addressed:

1. What are the perceived barriers and benefits in relation to access and usage of telehealth services for

rural African-American residents with disabilities and Opioid Use Disorder (OUD)?

2. What challenges do healthcare providers encounter when providing OUD services to rural African-American residents with disabilities and OUD?

Methodology

This qualitative study used focus group discussion (FGD) in an attempt to understand and identify key factors (barriers and benefits) that impact usage and accessibility of OUD treatment via telehealth for rural African-American residents with disabilities. Qualitative methods, including FGD, have been widely used techniques to explore experiences and perceptions associated with disability and health studies with similar topics of interest (Aref et al., 2017).

Selection of Focus Group Participants

We used a purposeful and convenient approach to select the participants for this study. The targeted pool of study participants consisted of rehabilitation counselors, substance use counselors, and mental health therapists who have provided treatment and vocational services to African-American service recipients with disabilities and opioid use in rural communities.

Profile of Participants

The focus group cohort (N =12) was drawn from a developed pool of professionals. They included vocational rehabilitation, substance abuse, and mental health service providers (e.g., counselors, clinicians) from four different agencies in the state of Oklahoma that provide outpatient or inpatient services to African Americans with OUD. To participate in the study, they were required to meet the following inclusion criteria: (a) currently working at an organization or agency that provides mental health and substance use treatment services for persons with disabilities and (b) must be at

least 18 years of age. Participation in the study was voluntary, and participants were able to withdraw from the study at any time. Participants completed an informed consent prior to the focus group discussion.

Of the 12 participants in the study, 75% were female and 25% were male having an average of 18.5 years of human service experience per provider, and 8.9 years of experience in OUD services. The majority or 59% identified as African American, 33% identified as Native American, and Whites represented 8% of the sample. In terms of educational levels, 58% of participants had a master’s degree, 9% had a bachelor’s degree, and 33% possessed an earned doctorate degree. Other participant descriptive and characteristic information is provided in Table 1.

Procedures

The study protocol was approved by the Institutional Review Board (IRB) at Langston University. The research team created the 15-question protocol designed to elicit participants’ experience and perspectives on factors that influence utilization of telehealth. We provided information to participants concerning the purpose of the study, confidentiality, and benefits prior to beginning the FGD. The study co-investigator and one other research team member facilitated the FGD, as three other research team members took copious observer notes about the discussion content, focus group dynamics, and other factors that contributed to the FGD process. The FGD was recorded by an audio-tape recorder. Verbatim transcripts, the observer notes, and the demographic profiles were the primary data for analysis.

Data Analysis

Data collected on participants’ demographic profiles were collected via PsychData.com, which is a platform to conduct surveys in social sciences. Qualitative data analysis used NVivo (Version 12), and included reading the transcripts, creating codes, triangulating data, reducing to essential points, and interpreting data. Initially, an open-coding approach was employed to allow themes to emerge from the data. Next, the investigators generated significant categories and codes through a thematic analysis process, including open coding, memo writing, and data comparison. These codes were reviewed for reliability by three investigators. The research team completed manual coding and developed an agreed upon code-book. Data comparison and the perspective of a fellow researcher was used when there was disagreement upon the research team. Codes were agreed upon by all investigators to increase trustworthiness and validity. Participant verbatim quotes served to validate the coding, investigators’ interpretations, and conclusions.

Results

NVivo identified themes that emerged from the data. Three of the eight factors/themes identified by the focus group participants, were barriers with the balance being benefits. The main themes were (a) improved communication/crisis response, which was articulated as a benefit (b) historical distrust, (c) decrease in stigma (d) digital divide (e) isolation of community (f) continuity of care – a benefit, and (g) opportunity and convenience for collaboration – also a benefit and (h) agency approval and authorization. The identified barriers from the FGD are below in Table 2.

Number	Gender	Ethnicity/Race	Profession	Type of Service
1	Female	African American	Mental Health	Mental Health Treatment (Outpatient)
2	Female	African American	Licensed Counsellor, Licensed Alcohol and & Drug Counsellor	Substance Abuse (Inpatient)
3	Male	African American	CRC, LPC-S	Vocational Rehabilitation
4	Female	African American	CRC	Vocational Rehabilitation
5	Female	African Americans	LPC Candidate	Vocational Rehab Substance Abuse (Outpatient/Inpatient) Mental Health (Inpatient/Outpatient)
6	Female	African American	LPC/CADC	Substance Abuse (Outpatient/Inpatient) Mental Health (Outpatient/Inpatient)
7	Male	Native American	Consultant/Mental Health Researcher	Mental Health (Inpatient/Outpatient)
8	Female	Native American	LCSW, LADMH-S	
9	Female	Native American		Vocational Rehabilitation
10	Female	Native American		Vocational Rehabilitation
11	Male	African American	Licensed Social Worker	Social Worker Substance Abuse (Inpatient/Outpatient)
12	Female	White	Licensed Alcohol and & Drug Counsellor	

Improved Communication/Crisis Response

Many of the participants identified improved communication as an advantage of utilizing telehealth services with African Americans with disabilities and OUD. These results reinforced previous findings (Au-Yeung et al., 2019; Cucciare & Timko, 2015; Egan, 2019) regarding the benefits of telehealth for improved quality of healthcare services and diminished substance use by improving the quality of communication between the providers and clients. Participants further identified specific benefits as using telehealth when transportation is an issue, and how this modality assisted with isolation and reconnecting to the community. Telehealth was described overall as a supportive tool to help African Americans with disabilities in rural communities with prescription refills, and having the flexibility to speak with a medical provider. As explained by one participant:

“They can also use it [telehealth] when transportation is an issue to get to their therapy appointments, not just for their medications and their doctor refills, but to be able to talk to somebody when they really need it”

Another participant described improved communication as allowing African Americans with disabilities in rural communities to participate in community elements and reconnect back with their community. As one participant explained: *“it [telehealth] puts that community element back into it so whatever it is that you’re dealing with, you’re not on an island anymore.”* As reflected in this individuals’ detail, telehealth provides the opportunity to provide holistic and specialty care. Several participants also identified telehealth as being a tool that helps with crisis intervention communication. One participant stated, *“They can also use this [telehealth] to be able to talk to somebody when they really need, there’s a way that they can contact their person through that iPad system, that they have set up, to be able to get the help they need when they need.”* Participants also identified the benefit of reaching out to those within the rural communities. One participant stated, *“We have been giving out iPads so that we can communicate with clients that are in rural areas.”* Participants also felt that clients were appreciative of telehealth, *“the majority of them really use them [iPads] and appreciate having them [iPads], and it’s not like where they can do a lot of things with it [iPads], but they can talk to the doctor and get medication refills and a therapist.”*

Historical Distrust and Stigma

Nearly all participants identified fear and distrust as a barrier to providing OUD treatment via telehealth for African Americans with disabilities in rural communities. They mentioned lack of trusting the system, historical mistrust of a “closed community”, identity protection, and fear of their confidentiality being violated. The following quotes from participants illustrate how the distrust among African-Americans rural residents with OUD manifested:

“Fear and distrust of the system, and especially, “On this thing [iPad] that I’m looking at, I don’t trust this process.”

“They may feel like they’re being recorded, or it’s going to be stored and kept and then brought up like,”
Hey we saw you saying this.”

“I totally agree with the mistrust and the access. Our agency hasn’t started using it [telehealth] yet. But some of my clients, they distrust filling out the applica-

tion. So just thinking about having to use technology, they’re like, “What is this?” And a lot of mine, they’re like, “What is this?” And a lot of mine, they’re just now using the cell phone. They don’t even have an email address, like “set yourself an email address so we can communicate.”

The African-American community has a historical distrust of formal systems, such as the healthcare system, which is largely attributable to the Tuskegee Syphilis Experiment (James & Jordan, 2018; Saberi et al., 2013; Sun et al., 2016). Similar findings were reported in how African Americans and Latinx individuals feel about telemedicine; George et al. (2012) reported that technology issues with confidentiality and privacy were concerns of African-American participants. The concern among these study participants was that personal information shared via e-technology would be stolen or accessed by unauthorized individuals. African-American participants perceived that aspects of the internet and technology are “insecure” and “for anybody”. Some participants felt concern about their identity possibly “floating around”; participants seem to not trust that their health information would be kept confidential.

Privacy issues related to the infrastructure of telehealth include the transmission of tapes, patient record data, phone calls, all of which raise concerns of possible privacy violations for professionals. Schopp et al. (2006) implied that clients may have concerns with confidentiality as well as privacy due to not being familiar with technical infrastructure and operations of videoconferencing. It is likely that these concerns of telehealth may cause hesitancy and refusal to utilize services. Educating rural clients concerning the appropriate usage of telecommunications and equipment, could likely assist with alleviating the overall concern of risk of privacy loss (Schopp et al., 2006).

Participants also discussed fear held by African-American rural residents with disabilities and OUD because of a concern of exposing their self-information. Many of the participants identified that this population had a legal concern for their confidentiality being threatened in the telehealth process. As one participant highlighted:

“Whenever you started saying that I even got a moment of like, okay now some people try to use those,

Table 2
Barriers and Benefits in Utilization of Telehealth for OUD Services of PWD

Barriers	Benefits
<ul style="list-style-type: none"> • Isolation of community • Agency approval • Agency authorization • Licensure approval across state line • Digital divide 	<ul style="list-style-type: none"> • Improve communication and crisis response. • Decrease in stigmatization • Convenience for collaboration of providers • Continuity of care

the legalities against you. So even as a professional, it's like, "Hold on, you're recording me? And are you trying to get me back?" So, there's a barrier too. So, there's an interest for the barrier not to be there."

Participants also identified their concerns with legalities, in regards to legal standards for clinicians, especially for the associate level clinical professionals. Standards and guidelines for providing services across state lines are also inconsistent and appears to be a reason of hesitation in implementing telehealth services to PWD in rural communities. This was identified as a barrier to providing services due to non-existent licensure, insurance policies and guidelines on reimbursement, payments, and authorization of associate level clinicians (i.e., LCSWA, LMHCA).

Historical Distrust and the Digital Divide

The overall concept of distrust for this community, are concerns for confidentiality and the "fear of exposure of self-information", which are barriers for both consumers and professionals. Having access to internet modems was also a barrier to accessing health care via telehealth. Participant 1 highlighted the unavailability of internet modems in the rural communities:

"Being able to get a modem is really difficult for a lot of people. We've had to try and find some resources to get some modems for some rural clients of ours."

"And they did buy a modem, and their modem broke. And they were trying to figure out how do I get another one in order to continue my services, and there just aren't any modems out there that people will donate to you that we've found."

"So, there were some fundraising things going on in order to get these people a modem. So maybe Cox Cable or AT&T or some of the others would be willing to donate modems to people for this service. That would be helpful."

It is a critical matter for accessibility to technology modems to be considered for the overall adoption of telehealth services for African-American rural residents with OUD and disabilities.

Isolation of Community

Arguably, factors of isolation are complex and represent a specific concern of clinicians in implementing telehealth for OUD services for this rural population. Participants identified the following key concerns of community isolation:

"I think it can kind of keep that person more isolated. You know, they don't get to leave their community. They don't know what else is out there"

"So, I think using that telehealth medicine is a good deal, but on the other side, making sure that they're not isolated, that they're still on track with everything, that they're actually doing what they're discussing and things like that"

"They don't know what is out there. They don't get to experience other things and meet new people that might have different ideal from them. So, they're a little bit more isolated, I think."

Agency Approval and Authorization

Additional factors identified as barriers to the adoption of telehealth were agency approval and authorization. When asked the question of reasons the participants and/or their agencies have for not using telehealth, the participants indicated limitation within agency policies, approval and authorization from senior leadership and administration. Licensure limitations are a factor; no agency or clinician needs to use telehealth services, lack of compensation, prohibition, and regulatory issues were all factors that influenced utilization. Clinicians indicated that a barrier to implementing clinical services via telehealth was difficult due to the inconsistencies and lack of guidelines and policies supporting use. As one participant expressed:

"One of the agencies that we contract with has not approved for us to do it [telehealth] yet. They keep saying 'Nope you can't do it.' No, we don't want that." So, we haven't implemented [telehealth] for that reason."

"At my agency that [use of telehealth] is allowed, but not when you're candidate. So, if you're a candidate, you're not allowed to use it [telehealth]. And I haven't really researched it to see if there's an Oklahoma-regulation, like as far as Oklahoma doesn't allow it, for the candidate to use."

"My agency is using tele mental health, and had social workers available Monday-Friday from 8:00 to 5:00, to set up appointments with veterans that were not in a 50-mile radius."

"They could go in and access and talk to a therapist through their smart phone or even at a satellite clinic, if that was closer. And then they would connect with the therapist that way."

Other participants indicated that their agencies were in the stage of considering adoption of telehealth in their organization., *"but I did hear them speak about it [telehealth] and say that they're in the works of getting it [telehealth] approved."* Rural health care systems' adoption of telehealth is a critical contribution for the rural community to have access to specialty providers. Technology serves to break certain barriers to transportation and scarcity of specialty care, but the utilization of telehealth has been reported to be low, so these perceptions are not surprising (Cassity-Caywood, 2019).

Continuity of Care

Although barriers were identified, several benefits were noted by the participants related to implementing OUD services via telehealth for African Americans with disabilities in rural communities. When asked the question of, if telehealth could improve the continuity of care for OUD in this population, participants identified consistency of care provisions, the ability to reach out to the community, convenience, compliance, and making access easier as factors that benefit the overall continuity of care. One participant cited easier access as a contribution to the continuity of care and compliance: *"It gives continuity of care, and so if it makes access to healthcare easier by calling in or messaging, then that can hopefully improve compliance to treatment in general."*

Others in the FGD described continuity of care as facilitating consistency, as evidenced by the remark: *“not only the continuity of care, but just ensuring that the level of care is consistent. Even in times where they may not have the means to get to the doctor, be it transportation or whatever issue arises, the fact that you would be able to just connect with a provider at that point would allow you to have, I mean they just, it’s really a convenience to have, especially when you’re far out and when there’s no access and there’s limited resources.”*

Improved care was described as an advantage for this specific population, this included the ability for the consumers to meet with their specialty providers with ease. Consistency of care is easier with telehealth due to consumer’s ability to connect with providers with convenience and ease of technology. Consumers are more likely to have access to sessions due to the convenience of being able to connect to their provider from anywhere. One participant indicated: *“I think that it would improve not only the continuity of care, but just ensuring that the level of care is consistent. Even in times where they may not have the means to get to the doctor, be it transportation or whatever issue arises, the fact that you would be able to just connect with a provider at that point would allow you to have, I that would be great if I could go and see my doctor and be like “Hey, need to go and can you refill this one real quick.”*

The factors of convenience have been cited in literature as being a positive outcome (i.e., benefits) in telehealth services with OUD and mental health treatment (Au-Yeung et al., 2019; Cucciare & Timko, 2015; Egan, 2019). Another benefit raised in the discussion was the reduction of stigma related to OUD and mental health services, as it provides reliable choices for the consumer (i.e., not having to drive to appointments and not being seen going into an actual clinic to receive help). Participants indicated that telehealth provided an advanced level of anonymity as consumers would not have the need to travel to a physical office. The reduction of stigma is afforded by consumers having the convenience to attend sessions from the comfortability of their own homes and not having to physically attend appointments. *“Speaking to African Americans as well as the disability portion of that question, maybe there are some things regarding stigma, so you don’t have to deal with the stigma like I’m walking to a mental health facility and there’s a stigma and pride, or, you know, angst against that, as well as there’s the comfort of being in your own home. That’s how telehealth can improve.”* This statement implies that the convenience of engaging in a telehealth session at home also reduces the likelihood of clients feeling ashamed and reluctant to participate in services. Historically, stigma has been a factor that has impacted the health seeking behaviors of African Americans with OUD and mental health services (George et al., 2012).

Opportunity and Convenience for Collaboration

Although there were external and cultural factors that impact barriers and benefits of OUD telehealth services, participants who reported use indicated that telehealth provided the opportunity to implement a community-based approach to treatment, which is an additional benefit. When asked the question of whether telehealth improved integrated health, participants highlighted a treatment team approach, multidisciplinary health team, holistic care, and

making coordination easier in care. From their perspectives, it was more of a unified voice, and inclusive of persons with disabilities.

The ability to provide multiple types of treatment for OUD would be enhanced, whereas it would be difficult with traditional face-to-face organizational behaviors, and this, too, was voiced as a benefit. Telehealth is unique in how participants identified inter-agency collaboration possibilities due to the convenience of communication. One participant described it as: *“We can use it [telehealth] with other agencies. If we have someone that stays at my facility, and they just showed up there for a bed, and they need to be detoxed, and maybe the detox crisis center is full, I can then correspond with the referral center. Or, if we have someone that maybe they have a kid that’s in crisis and they need to go to St. Anthony’s, so you can use it for other places. I mean that’s a great benefit.”* Another positive aspect of collaboration articulated was the treatment team approach, as another participant stated: *“Having the person at the table who needs the services. And so, say you’re working with an interdisciplinary team, but they can’t get to you, but all of your medical people are there at the same place, then it could be possible to coordinate a meeting where they’re all in the same room and you can come in with me, via telehealth, have all of your providers in the same room and get opinions and advice or form a treatment plan with all of those voices together instead of just well you know, “My counselor said this and then my primary said this and my pain doctor said this. And then my whoever else said this over here”, and nobody’s speaking the same language, but we’re all talking about the same person.”* A final benefit articulated was that this modality of providing OUD treatment to the African-American rural communities was cited by participants as an opportunity to centralize services and have stakeholders (i.e., persons with disabilities) present in one room to discuss prognosis and treatment needs versus the lapse of time in services due to the need of scheduling appointments and seeing providers based upon their availability in the traditional manner, which is less than optimal.

Discussion

This study offers findings that begin a path of knowledge that could ultimately, once replicated in quantitative investigations, contribute to what we know about the likelihood that African-American rural residents with disabilities and OUD will embrace treatment services delivered via telehealth. Findings also contribute to the existing knowledge base on important factors in providing specialized telehealth services. In spite of some studies indicating that telehealth provides the opportunity for quality and specialty care in rural communities, it appears that not all rural healthcare agencies have adopted this practice of providing OUD treatment. To date, there is limited research available in this area concerning rural health care systems’ adoption of telehealth, which is vital in understanding factors that impact accessibility and utilization (Shulver et al., 2017; Usher-Pines et al., 2020). Ample literature and research about the specific cultural factors that may impact African-American rural residents with OUD and other disabilities engagement with telehealth services was also unavailable.

The FGD supported the identification of the following main themes as telehealth utilization barriers; digital divide and isola-

tion of community. Participants communicated that the benefits were improved communication/crisis response, historical distrust/stigma, continuity of care, opportunity and convenience of collaboration. Our research found that participants' (clinical service professionals) perceptions were consistent and formed a direct consensus around factors that constitute barriers and benefits to providing telehealth services. Within this context, there are several factors mentioned in the FGD that might be actionable. First, the barrier of the digital divide and having access to telehealth services were discussed as being resolvable by making Internet modems more available to consumers residing in the rural communities. This action supports the need for first understanding the nature of the digital divide for rural healthcare agencies and African Americans with disabilities. Resolution should focus on what specific equipment, personnel, training, and policies are needed to implement this service for use by target population members. There may be specific multigenerational, gender, family, and community needs that should be highlighted from the perspectives of the service recipients that might be worth noting.

Literature has generally encouraged an increase in research activities to support the overall adoption of telehealth from the healthcare and organizational aspect. The policies and behaviors that create barriers should also be further explored to discover the professional and training needs. A review and audit of telehealth policies specifically within the rural health care system should be a priority to understand what recommendations are needed to achieve full integration. In other words, policymakers should be made aware of the limitations of agency and statewide standards of telehealth that limit accessibility.

The literature has supported the critical need for further examination of standards that are currently sending contradictory messages across states. These factors are causing prohibition of telehealth utilization for OUD treatment in rural communities (Keyes et al., 2014) Future research should solidify recommendations that would actionably address barriers for healthcare organizations and African Americans with disabilities in rural communities.

Additionally, fear and distrust among African-American rural residents with disabilities and OUD is a barrier related to telehealth services. The historical distrust of formal healthcare systems was identified as a contributing barrier. Such barriers have been described as fear of information being lost and confidentiality being compromised in the telehealth process. These results are consistent with what other researchers have found (George et al., 2009; George et al., 2012). There may be a need for technology platforms that promote education concerning telehealth that could be provided to the clients and the community overall, so that the level of apprehension would decrease.

Increasing knowledge of telehealth and how it has similar benefits and the same ethical responsibility of maintaining privacy as face-to-face services should be shared with the community. Also, sharing the education of HIPPA compliance within the applications and platforms used for telehealth could help ease worries. Advocates would need to reach out to rural healthcare agencies, OUD professionals, and African Americans with disabilities in rural communities to create a culture of transparency and under-

standing with presentations providing education and awareness of telehealth services. Effective training and education will not only impact consumer utilization, but based upon this study's results, i.e., the perspectives of clinical professionals as well.

Finally, issues with preventing community isolation were identified as a concern with implementing telehealth for this population. The findings on community isolation are inconsistent with the views of scholars who noted that telehealth brought more of a convenience for alleviating isolation of specific communities (Benavides-Vaello et al., 2013; McGinty et al., 2006; Zhou et al., 2020). Creating models for OUD treatment via telehealth could perhaps assist with eliminating isolation of consumers in time. The literature has supported an increase of healthcare research in this area to ensure quality service prevents such factors (i.e., isolation) from contributing to non-adoption (James et al., 2016; Shulver et al., 2017; Usher-Pines et al., 2020). An increase in empirically-driven research will assist with expanding telehealth services and creating models that address the concern regarding isolation in this community.

Limitations and Future Research

This study has three limitations. The first limitation is that it is an initial, exploratory study of this topic and so major conclusions drawn from the results may not be plausible. Secondly, the FGD participants in this qualitative investigation represent only part of the relevant perceptions (i.e., those of clinical service professionals) needed for a complete perspective. A complete perception would necessarily require the views of African Americans with disabilities in rural communities as well. Also, while qualitative research is valid and meaningful, in this study the data collection process consisted of only one FGD. An additional limitation is that though the clinical service professionals provided their perceptions, most are based on speculation about barriers and benefits to usage of telehealth in the target population, since many have no firsthand experience actually working in an OUD telehealth service delivery program.

Nevertheless, this study offers a starting contribution to the literature on this new topical area of exploration. Therefore, the opportunities for follow up studies are plentiful. For example, there may be a need for additional, larger qualitative inquiries as well as quantitative investigations, and mixed methods studies examining this topic. Such subsequent investigations would advance the burgeoning knowledge in the general topic area of telehealth, how this service delivery modality applies to OUD, and how it applies to underserved people of color with disabilities.

Conclusion

Researchers and rural healthcare delivery systems should analyze policies and organizational behaviors that may precipitate or sustain barriers or offer benefits to implementing OUD telehealth services to African-Americans residing in rural communities. The findings from this study identify key preliminary concerns and insights on barriers and benefits of rural telehealth delivery in providing OUD services to members of this target population. Launching more research investigations that specifically address

this topic would be important. Such subsequent research efforts should be comprehensive and focus on the perspectives of African Americans with disabilities from rural communities, as well as leadership and administration from healthcare agencies. Increased research will also provide the opportunity to begin to understand the effectiveness of telehealth OUD services in the rural areas; and ultimately promote this service delivery modality as a viable alternative to traditional face-to-face services.

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Emerging Conceptual Frameworks for Co-Serving Veterans of Color Across the State-Federal Vocational Rehabilitation Program: SVRAs, AIVRPs, and VA-VR&E

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Existing models of interagency collaborations serving the United States (U.S.) Armed Forces veterans of color, i.e., African Americans, Latinx, Native Americans/Alaskan Natives and Asian Americans and/or Pacific Islanders are sparse, and few co-service partnership models are available. This article proposes two different emerging conceptual frameworks, i.e., state vocational rehabilitation agency (SVRA) and the U.S. Department of Veterans Affairs Veterans Readiness and Employment Program (VA-VR&E) co-service model, and American Indian Vocational Rehabilitation Program (AIVRP) and VA-VR&E co-service model designed to enhance successful employment outcomes for these veterans. Diffusions of Innovations Theory was used to develop the Co-Service Models. A set of recommended approaches that these agencies and researchers can consider are presented.

Keywords: *Veterans of color, co-service practices, partnership models, vocational rehabilitation services*

Veterans of color include African Americans, Latinx, Native Americans or Alaskan Natives, and Asian Americans and/or Pacific Islanders and comprise approximately 23% of all veterans residing in the United States (U.S.) (N = 18,263,035) (National Center for Veterans Analysis and Statistics, 2019). Of these veterans, approximately 11.5% are African American, 7.3% are Latinx, 1.8% are Asian and/or Pacific Islander, and 0.7% are

Native American or Alaskan Native. Native Americans or Alaskan Natives continue to enter into the U.S. Armed Forces at higher rates than any of the other racial or ethnic groups (Kaufmann et al., 2016; U.S. Department of Veterans Affairs, 2016).

Many of these veterans return from active duty with varied service-connected physical and mental disabilities such as traumatic brain injury and chronic pain (which can co-occur) with high rates of depression, anxiety, and substance abuse (Dillahunt-Aspillaga & Powell-Cope, 2018; Hawley et al., 2016). The most prevalent service-connected disabilities for veterans of color include tinnitus, post-traumatic stress disorder (PTSD), lower back pain, hearing impairments, and limited leg movements (Carlson et

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al., 2018). Additionally, about 17% of veterans of color have a service-connected disability rating, while an even greater percentage, about 24%, of Native American or Alaskan Native veterans have a service-connected disability rating (National Center for Veterans Analysis and Statistics, 2019). For Native American or Alaskan Native veterans, these disorders can also have a detrimental effect on the community to which they return due to the close interconnectedness of Indigenous communities and families (Kaufmann et al., 2016).

Of central importance to veterans of color with disabilities is becoming employed upon their return to civilian life (Moore et al., 2015). The return to civilian occupational functioning is a major aspect of successful reintegration (Dillahunt-Aspillaga et al., 2018; Moore et al., 2016). As they transition to civilian life, veterans will likely require various vocational rehabilitation (VR) services for assistance in returning to work (Pogoda et al., 2018). Contemporary state vocational rehabilitation agency (SVRA) level data analyses (Moore et al., 2016; Moore & Wang, 2016) empirically documented employment outcome disparities among veterans from this target population. For example, Moore et al. (2016) extracted and analyzed the national fiscal year 2013 Rehabilitation Services Administration (RSA)-911 case records (N = 11,337) representing veterans served by SVRAs. Further, Moore and Wang (2016) used the same database and extracted, re-sampled across multiple trials via the bootstrap technique, and analyzed case records (N = 11,603) comprising veterans of color with disabilities. In both articles, the authors found that veterans of color were less likely to achieve successful employment outcomes than their White veteran counterparts. Specifically, they found that African American veterans, Native American or Alaska Native veterans, Latino, Asian American, or Pacific Islander veterans had the lowest probabilities of successful return-to-work outcomes.

SVRAs, American Indian Vocational Rehabilitation Programs (AIVRPs), and the Veterans Affairs-Veterans Readiness and Employment (VA-VR&E) program provide various employment and placement services that assist veterans in securing employment. Each of these agencies provides similar services such as needs assessment, Individualized Plan of Employment (IPE), job training, job placement services, referrals to other appropriate agencies, vocational counseling, and assistive technology services (Consortia of Administrators for Native American Rehabilitation [CANAR], 2020; Oklahoma Department of Rehabilitation Services, 2020; U.S. Department of Veterans Affairs, 2017). In addition, veterans with disabilities may be able to simultaneously receive employment services from these agencies depending on eligibility requirements (CANAR, 2020; Council of State Administrators of Vocational Rehabilitation [CSAVR], 2020; North Dakota Division of Vocational Rehabilitation, 2010; Oklahoma Department of Rehabilitation Services, 2020; U.S. Department of Veterans Affairs, 2017). While the positive effects of VR services provided to veterans by the state-federal VR programs are well documented, a lack of service coordination prohibits awareness and effective utilization by the veterans (Johnson et al., 2016; Luecking et al., 2015). Hence, veterans of color with disabilities continue to experience disproportionately higher unemployment rates (Hawley et al., 2016; Johnson et al., 2016; Moore & Wang, 2016). The lack of

available co-service practices and models could contribute to race-based disparities in employment outcomes.

The purpose of this article was to present an emerging conceptual framework for designing, implementing, and evaluating interagency co-service practices and partnership models between SVRAs and VA-VR&E programs and AIVRPs and VA-VR&E programs. Identifying such models could increase the quantity and quality of services and employment outcomes experienced by target population members. Collaboration between these agencies could bring about systems changes that support and sustain an infrastructure for the provision of effective co-service strategies. Additionally, this article analyzes peer reviewed grey scholarly and empirical literature (e.g., monographs, government technical reports) relating to interagency co-service practices and the need for co-service models. Utilizing Diffusion of Innovations Theory as the theoretical perspective, the emerging Co-Service Models developed between SVRA and VA-VR&E and AIVRP and VA-VR&E and the application of these models is presented. Recommendations for the possible adoption of the models of co-service practices by these agencies are also discussed.

The Need for Co-Service Models at Vocational Rehabilitation Agencies

Researchers have shown that interagency collaborations correlate positively with higher rates of successful employment outcomes and increased engagement in work-related activities. For example, Kennedy-Lizotte and colleagues (2018) identified interagency collaboration as an effective strategy for fostering employment. In a significant and unique study, Fleming et al. (2013) reviewed 35 rehabilitation research studies examining employment-focused interventions, of which 10 had interagency collaboration as a focal point. These researchers identified the following key interagency partnerships as “best practice collaborations”; SVRAs/AIVRPs, mental health agencies, colleges, and universities, as well as one-stop centers. Yet, these collaborations are not generally widely or consistently executed or maintained (Taylor et al., 2016; Wright et al., 2016).

Individually, SVRA, AIVRP, and VA-VR&E agencies provide employment services that effectively assist veterans of color in becoming successfully employed (Chiu et al., 2013; Crudden & Steverson, 2018; Valle et al., 2014). Additionally, these organizations engage in co-service practices that they consider effective for contributing to successful employment. However, some investigators (Johnson et al., 2017; Johnson et al., 2020) reported that co-service practices were engaged in sporadically and not as routine and normal practices in the provision of employment services. Furthermore, researchers (Kennedy-Lizotte et al., 2018; McDonnall & Cmar, 2019) found that service provision by these agencies is disjointed and isolated; consequently, veterans of color with disabilities are not always aware of all the services available to them by each of these agencies which results in restricted comprehensive individualized plans of employment that diminish successful outcomes.

Barriers and challenges that may impede the implementation and institutionalization of interagency collaborations have also

been identified. Such challenges included differing agency infrastructures, concerns with privacy policies, personnel, and financial concerns due to lack of central management, and even different perspectives on priorities for accomplishing the same outcome of service provision (Kennedy-Lizotte et al., 2018; Wright et al., 2016). In a study that surveyed interagency collaborations of VR counselors, Taylor and colleagues (2016) pointed out that dissimilar procedures, philosophies, and biases contributed to a lack of collaboration. In sum, research supports interagency collaborations' effectiveness in enhancing employment services provision while also pointing out different factors that impede successful collaborations.

Lastly, a review of the extant literature revealed a few collaboration models that included state and federal VR agencies as primary partners. For instance, the Institute for Community Inclusion (ICI) conducted a series of studies that analyzed collaborations between state agencies (Brent et al., 2018; Kennedy-Lizotte et al., 2018; Winsor et al., 2018). Findings reported that these models (a) contributed to enhanced employment outcomes across three state systems that included VR agencies, (b) reflected robust interagency collaborations between federal and state agencies that contributed to enhanced competitive employment, and (c) provided states the opportunity to collaborate on defining and redefining funding sources, policies, and services to improve employment outcomes.

Theoretical Foundation for Adoption of Co-Service Models: Diffusion of Innovations Theory

Researchers suggest that interventions based on theoretical foundations are more effective than interventions not based on a theoretical foundation (Manyibe et al., 2015; Nilsen, 2015; Vlaeyen et al., 2017). Manyibe et al. (2015) noted that a theory could be defined as a set of interrelated concepts, definitions, and propositions that explain or predict events or situations by specifying relations among variables. Further, Nilsen et al. (2015) and Vlaeyen et al. (2017) stated that a theoretical base is needed to fully implement an intervention, such as guiding knowledge translations from research to practice, understanding what factors influence implementation, and ways to evaluate the intervention.

Diffusion of Innovations Theory (Rogers, 2003) provides a theoretical perspective for understanding how to promote the adopting and the emergence of SVRA and VA-VR&E, and AIVRP and VA-VR&E Co-Service Models. Essentially, the theory explains how an innovation such as new ideas, practices, or strategies are spread into a social system and what will likely increase or decrease innovation adoption. Diffusion is the process by which an innovation is communicated among members of the social system to promote the adoption of the innovation, and the perceptions and characteristics of the members of the social system determine the rate of adoption.

As previously discussed (i.e., Johnson et al., 2016), Rogers (2003) proposed four main elements that would influence the diffusion of the Co-Service Models: the innovation, communication channels, the social system, and time.

Innovation

Innovation refers to ideas, processes, policies, or procedures perceived as new by potential adopters and would create a change in the social systems involved (Rogers, 2003). A significant barrier to the adoption of an innovation is uncertainty by the potential adopters about the consequences of the implementation of the innovation. However, this uncertainty can be addressed by discussing the advantages and disadvantages of the innovation in the current social system.

Communication Channels

A communication channel is the means by which information and messages are sent through a social system. Rogers (2003) noted two types of communication channels that affect the adoption rate of innovation: mass media and interpersonal communication. Mass media can include TV, radio, newspaper, and Internet to effectively communicate expert objective knowledge to potential adopters. However, Rogers highlighted that this knowledge alone does not contribute to a rapid rate of adoption. Rather, interpersonal channels are more effective in increasing the likelihood that the innovation will be adopted. Interpersonal channels of communication increase the adoption rate because people in the social system rely more on the subjective evaluation of peers than scientific research by experts.

Social System

Rogers (2003) defined the social system as "a set of interrelated units engaged in joint problem solving to accomplish a common goal" (p. 23). The social system comprises the context in which the innovation will be diffused. The structure of the social systems determines the boundaries, the norms, and the patterns of behavior that affect diffusion. Another characteristic of the social system that affects diffusion is opinion leadership, which is characterized by the ability of individuals to influence others' opinions, attitudes, and behaviors informally.

Time

The element of time refers to the interval between the introduction of innovation and the subsequent adoption or rejection of the idea (Rogers, 2003). A major aspect in the element of time that affects the rate of diffusion and adoption is the category and attributes of *Adopters*. Rogers (2003) described five categories of classifications of the people involved in the diffusion of an innovation that impact the rate of adoption. About 2.5% of the social system are *Innovators*, the first to adopt because they tend to be open to new ideas, willing to take risks, and can cope with high levels of uncertainty related to innovations. Innovators have less ability to influence adoption and serve more to introduce an innovation. *Early Adopters*, about 13.5% of the social system, are next to adopt because they tend to be highly regarded and likely hold leadership roles in an organization; others within an organization often seek the opinions of Early Adopters. About 34% of the social system are the *Early Majority*, described as not the first or the last group to adopt as they tend to deliberate more than Innovators and Early Adopters before their decision. Yet, the Early Majority do adopt just ahead of the average members of the organization. The Early Majority serve as an important link in the diffusion process because they are usually willing to follow the influence of the Early Adopters. Also, about 34% of the social system, the *Late*

Majority tend to be cautious and skeptical about whether to adopt due to the uncertainty of an innovation. Peer and social pressure or economic incentives often influence this group. Thus, they are inclined to adopt only after the majority of their peers have adopted the innovation. The final category of classifications of the people in the diffusion of an innovation that impacts the rate of adoption is *Laggards*. Nearly 16% of the social system are the last to adopt an innovation because they tend to prefer the past and tradition rather than change. Thus, the decision to adopt or reject an innovation depends largely on what was done in the past. Laggards, can play a vital role because they reveal concerns and critiques not considered by other categories and can influence the adoption rate of the Late Majority. Each category, from Innovators to Laggards is significant to the innovation's rate of adoption. As the innovation starts to spread, the number of adopters increases until adopters outweigh those who reject the innovation, and the innovation becomes self-sustaining.

The four primary elements of the Diffusion of Innovations Theory explain factors that help and hinder the spread and adoption of an innovation. The Diffusion of Innovations Theory is appropriate for use in the adoption of the emerging SVRA and VA-VR&E, and AIVRP and VA-VR&E Co-Service Models because in accordance with Diffusion of Innovations Theory, implementing co-service practices would utilize service practices which the agencies already individually use. The innovation would be using the existing service practices in a different way that would enhance the agencies' abilities to provide employment services. The overarching goal of the adoption of the Co-Service Models is to provide a greater level of employment services for veterans of color with disabilities. Thus, the theory can be used to provide guidance and a process for bringing effective change to accomplish this goal.

Emerging SVRA and VA-VR&E and AIVRP and VA-VR&E Co-Service Models

Recent studies (Johnson et al., 2017; Johnson et al., 2020) addressed the paucity of available information on effective co-service practices focused on veterans of color co-served by SVRAs and VA-VR&E and AIVRP and VA-VR&E. In the first study, the researchers collaborated with CSAVR to examine the perceptions of SVRA administrators (N = 39) with regards to SVRA and VA-VR&E promising co-service practices that could facilitate improved employment outcomes for veterans of color with disabilities (Johnson et al., 2017). In the second study, the researchers collaborated with CANAR to investigate the perceptions of AIVRP administrators (N = 35) about AIVRP and VA-VR&E promising co-service practices (Johnson et al., 2020). Both studies utilized a Co-Service Partnership Survey to gather data on the respondents' perspectives of effective co-service practices between SVRA and VA-VR&E and AIVRP and VA-VR&E. The Co-Service Partnership Survey was developed using input from a focus group that included Oklahoma Department of Rehabilitation Service counselors/specialists, program managers and field coordinators, and AIVRP vocational rehabilitation counselors. The focus group focused on eliciting participants' perspectives on varied co-services practices between agencies along with cultural influences, policies and procedures that influence collaboration of co-service practices. These collaborations and co-service practices were included,

whether deemed current or promising collaborations and co-service practices. Using NVivo, quantitative analysis yielded seven domains: current collaborations, previous collaborations, current or previous involvement in co-service practices, effectiveness of co-service practices, benefits of co-service practices, barriers to co-service practices and positions that participate in co-service practices. These seven domains, a review of literature, and input by content experts were used to develop specific questions relating to the effectiveness of these co-service practices.

Analysis of the Co-Service Partnership Survey yielded co-service practices between the agencies that were identified as moderately, very or extremely effective: joint training manuals, cultural training provided by one agency to another, co-communication procedures, joint referral processes, co-responsibilities, joint resources allocation determination, joint conflict resolution procedures, integrated manual of resources, Memorandum of Understanding between agencies, informal agreements between agencies, collaborative case reviews, collaborative case management, collaborative job placement services, collaborative job training services, and collaborative job maintenance services that informed the development of the co-service partnership model. Further, these co-service practices were classified into five Promising Co-Service Practices that were included in the emerging SVRA and VA-VR&E and AIVRP and VA-VR&E co-service partnership models, as shown in Figure 1 and Figure 2, respectively.

Additionally, the focus group identified barriers that could impact collaborations and co-service practices between the agencies and several benefits that could result from interagency collaborations. The barriers included organizational culture differences in each agency, organizational policies and procedures different in each agency, funding sources allow for and preclude specific types of service provision, different levels of professional competency of agency personnel, lack of cultural awareness and sensitivity of population served by each agency, inconsistent collaborations or partnerships, level of interpersonal relationships, lack of intentional focus on or development of interagency collaborations, and lack of diversity in the workforce. While the proposed Co-Service Models did not include these specific barriers, the models provided for the professionals to assess the unique barriers and opportunities that would impact interagency collaborations in accordance with Diffusion of Innovations Theory as discussed later in this article. The benefits included reduce fragmentation of services, increase productivity in employment outcomes, reduce redundancy and overlap of services, enhance efficiency in service provision, inform effective policy change, contribute to effective change in organizational culture, provide wider array of services, provide greater access to resources and services, and increased coordination among service providers. These benefits were catalogued into five short-term benefits and one long-term outcome that were included in the emerging SVRA and VA-VR&E and AIVRP and VA-VR&E co-service partnership models, as shown in Figure 1 and Figure 2, respectively.

The SVRA and VA-VR&E and AIVRP and VA-VR&E Co-Service Models were developed to promote interagency collaborations between these agencies in delivering job placement and employment services to veterans of color with disabilities.

The key principles used to guide the development of the models and corresponding application were derived from the Diffusion of Innovations Theory (Rogers, 2003) and recent relevant studies (Johnson et al., 2017; Johnson et al., 2020). The models represent emerging conceptual frameworks for utilizing co-service practices between SVRA and VA-VR&E and AIVRP and VA-VR&E in providing employment service for veterans of color with disabilities. Diffusion of Innovations Theory identifies relevant factors that could enhance the adoption of these Co-Service Models in addition to focusing on how to adapt an innovation to mesh with the needs of each organization in ways that result in the organizations adopting, implementing, and merging the new innovation of Co-Service Models into their policies and procedures. Further, the new innovation would use existing procedures within the agencies in a novel way that adds value. Such is the case with the SVRA and VA-VR&E and AIVRP and VA-VR&E emerging Co-Service Models that conceptualize individual existing co-service practices between these agencies into a co-service model. As previously noted, these agencies engage in co-service practices inconsistently and individually that are effective. Nevertheless, employment disparities still exist for veterans of color with disabilities (Johnson et al., 2017; Johnson et al., 2020).

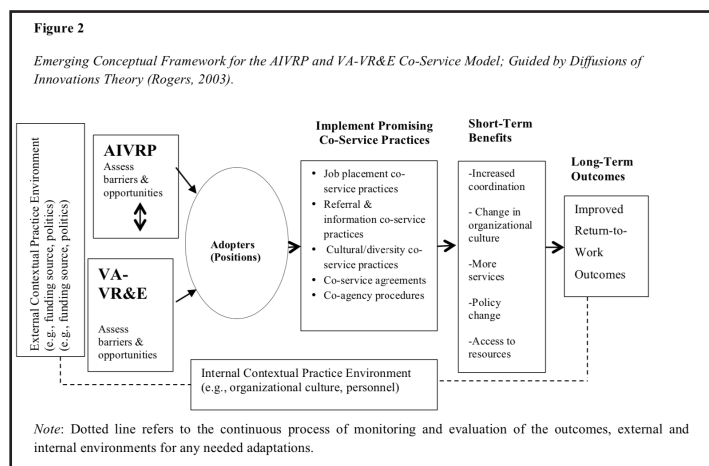
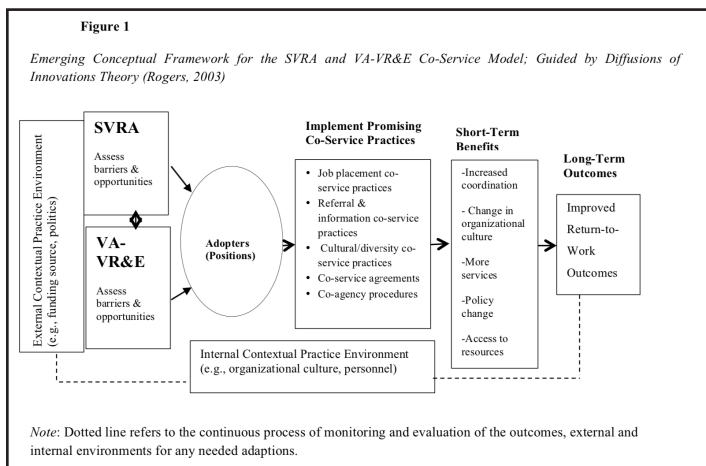
Figure 1 and Figure 2 present a graphic representation of the Co-Service Models. The Co-Service Models include six broad variables: potential adopters, barriers and opportunities, implementation of co-service practices, short-term benefits, long-term outcomes surrounded by the external and internal contextual practice environments. The external and internal contextual practice environments correspond to the social system of Rogers (2003) Diffusion of Innovations Theory as described in the previous section. Additionally, as previously noted (Johnson et al., 2016), awareness of the organizational structures of each of the agencies that comprise the social system, such as norms, policies, procedures, and the opinion leaders, directly affects the adoption of the innovation. Some researchers have found that the unique organizational structures, environmental factors, processes and purpose, and agency policies are all factors that can facilitate or hinder the adoption and utilization of the Co-Service Models (e.g., Ha et al., 2015; Vlaeyen et al., 2017). Further, as indicated in the Co-Service Models (Figure 1, Figure 2), the External Contextual Practice Environment can include such factors as funding sources and politics, while the Internal Contextual Practice Environment can include organizational culture and personnel factors.

As shown by the direction of the arrows, with the exception of the variable of Adopters (Positions), the linear interaction among these variables serves to enhance each variable in the goal of improving employment outcomes for veterans of color with disabilities. As indicated by the oval shape of the variable Adopters (Positions), this variable interacts in a non-linear and fluid manner with the agencies assessing barriers and opportunities as needed. Consistent with Diffusion of Innovations Theory, the interagency collaborations begin with communication of a shared vision as Adopters (Positions) come together to initiate the partnership. Further, determining who will participate and discuss barriers and opportunities is cyclical in nature because turnover in personnel may occur in the Adopters (Positions), resulting in new information on barriers and opportunities. Accomplishing the first two variables of identifying Adopters (Positions) and Assessing Barriers and Opportunities is critical to the initial application of the Co-Service Models.

Adopters or Positions

In the Diffusion of Innovations Theory, Rogers (2003) posited that the likelihood of adoption of an innovation such as the Co-Service Models depends on the types of people within the social system that is a part of the internal contextual practice environment of the emerging SVRA and VA-VR&E and AIVRP and VA-VR&E Co-Service Models. The Adopters in the Co-Service Models are all VR professionals, such as counselors, administrators, and support staff who collectively provide employment services for veterans of color with disabilities. Again, innovations are not simply adopted based on factual information. Rather, the connection of relationships in organizations has the greater effect on organizational changes (Rogers 2003).

Regarding the five types of Adopters described earlier, Innovators and Early Adopters are more likely to have leadership positions in the organization. In the context of Diffusion of Innovations Theory, these two types of Adopters have a significant influence on bringing the innovation to the organization and leading the innovation that affects later adoptions. However, equal consideration should be given to positions in the organizations that by virtue of the responsibilities of the positions, are crucial to the adoption of the emerging Co-Service Models, regardless of the type of Adopter in the position. For example, in the Co-Service Models in regard to co-service practices, it would be prudent to include the positions that provide direct services to veterans of color with disabilities re-



ardless of the type of Adopter in the position. At the initial collaboration between the agencies, Innovators would be identified, and subsequently, Innovators would identify other potential Adopters (Positions), all of whom would be responsible for guiding the variable Implement Promising Co-Service Practices.

Assessment of Barriers and Opportunities

Barriers and opportunities exist within each of the agencies that can hinder or facilitate the adoption of the emerging Co-Service Models by these agencies. Barriers can be defined as real or perceived factors that impede the use of an innovation and facilitators promote the implementation of an innovation (Vlaeyen et al., 2017). In the emerging Co-Service Models, facilitators are named Opportunities. Researchers have identified the significance of assessing barriers and facilitators. For example, studies generally indicate barriers to an innovation; however, it is also important to consider facilitators (Ha et al., 2015) because understanding both barriers and facilitators can positively impact the adoption of an innovation (Vlaeyen et al., 2017). Additionally, it is crucial to assess the barriers and opportunities as perceived by all stakeholders due to the subjective nature of perceptions (Bossink et al., 2017; Moore et al., 2016; Moore et al., 2017). Stakeholders in the emerging Co-Service Models would be the two agencies that comprise the Internal and External Contextual Practice Environments in the Co-Service Models. Indeed, Ritchie et al. (2016) considered assessing barriers and facilitators as a requisite first step in effectively implementing an intervention.

Assessing barriers and opportunities at the initial stage of the Co-Service Models align with Communication Channels in Rogers' (2003) Diffusion of Innovations Theory. Communication at the early stage of the Co-Service Models implementation is needed to initiate and sustain effective communication between the agencies to establish and implement the co-service practices within the Co-Service Models. Rogers defined communication as "a process in which participants create and share information with one another to reach a mutual understanding" (p. 5) and a channel as "the means by which a message gets from the source to the receiver" (p. 204). Again, Rogers suggested two types of communication channels that can impact the adoption of the proposed Co-Service Models: mass media and interpersonal communication. Both communication channels can be used in assessing barriers and opportunities. Adopters initiate the collaboration by discussing shared concerns and a goal of mutual vision of contributing to successful employment experiences for veterans of color with disabilities (Johnson et al., 2016). The emerging Co-Service Models allow adopters to consider the uniqueness and significance of each organization and how the different norms of the organizations will directly affect the adoption of the emerging Co-Service Models. Additionally, the aspect of uncertain consequences from implementing the innovation could be addressed through these communication channels (Rogers, 2003).

Short-Term Benefits

This variable contains several short-term benefits identified in two previous studies (Johnson et al., 2017; Johnson et al., 2020), which could result from engagement in co-service practices. These benefits included increasing coordination among service providers, providing a wider array of services, providing greater access to

resources, effective organizational cultural change, and informing effective policy change. The first three short-term benefits have a practice context and a direct benefit to increasing the ability of rehabilitation practitioners to provide employment services for veterans of color with disabilities. The last two short-term benefits have a policy context of organizational changes in the practice environments, resulting in enhanced policies that would benefit rehabilitation practitioners and consumers.

As indicated by the direction of the arrow in the emerging Co-Service Models, these short-term benefits result from implementing the variable Promising Co-Service Practices. In the context of Diffusion of Innovations Theory, the short-term benefits from implementing the variable Promising Co-Service Practices can increase the likelihood that the emerging Co-Service Models would be adopted and sustained and become standard practice (Rogers, 2003). Also, the relative advantage of the innovation is the degree to which the innovation is perceived to be better than the current practice (Rogers, 2003), which affects adopting and sustaining the innovation. The value of the short-term benefits identified by rehabilitation professionals in the two previously mentioned studies provides the opportunity for the emerging Co-Service Models to be perceived more effectively than the current practice of service provision; thus, increasing the likelihood of adoption. Further, researchers have agreed that such short-term benefits can mediate barriers and enhance motivation for continued utilization of co-service practices while working toward the long-term goal of successful employment outcomes for veterans of color with disabilities (Ha et al., 2015; Vlaeyen et al., 2017).

Long-Term Outcomes

In the emerging Co-Service Models, the overarching long-term goal is to improve the return-to-work outcomes for veterans of color with disabilities, which is the goal and mission of the SVRA, AIVRP & VA-VR&E VR agencies. Rehabilitation professionals at these agencies identified the promising co-service practices included in the emerging Co-Service Models as effective co-service practices that contribute to successful employment outcomes (Johnson et al., 2017; Johnson et al., 2020). The significance of improving employment outcomes for veterans of color with disabilities was included in legislation such as Section 21 of the Rehabilitation Act Amendments of 1998 that noted traditionally underserved populations (e.g., veterans of color with disabilities) were less likely to achieve positive employment outcomes (Moore et al., 2015; Moore & Wang, 2016). Furthermore, Section 21 of the Rehabilitation Act Amendments of 1998 documented employment disparities among Native Americans with disabilities and required AIVRPs to improve employment outcomes (McDonnall & Crudden, 2015). Recently, in 2016, the Workforce Innovation and Opportunity Act (WIOA) mandated veterans should continue to be given priority for job training services for programs funded by the Department of Labor and WIOA (WIOA Fact Sheet, 2016).

Furthermore, improved return-to-work outcomes can also result in positive individual and long-term societal outcomes. Possible long-term outcomes for veterans of color with disabilities as a result of implementing the emerging Co-Service Models include a better quality of employment positions, the establishment of careers, job retention, enhanced self-efficacy, increased financial

status and stability, and serving as contributors to the economic base within communities (Brent et al., 2018; Crudden & Steverson, 2018).

As previously noted in this article, studies have documented that a greater rate of successful employment outcomes result from interagency collaborations (e.g., Kennedy-Lizotte et al., 2018; Winsor et al., 2018). Yet, interagency collaborations occur inconsistently, and disparities in the employment success for veterans of color with disabilities have not been reduced (Moore et al., 2016; National Center for Veterans and Analysis and Statistics, 2019). Therefore, utilizing these emerging Co-Service Models can serve as a key mechanism for increasing and enhancing successful employment outcomes for veterans of color with disabilities.

Application of the Co-Service Models: Virtual Community of Practice

A Community of Practice (CoP) can be characterized as “groups of people who share a concern, a set of problems, and a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Seibert, 2015, p. 70). Additionally, CoPs consist of interrelated components: domain, community, and practice (Seibert, 2015), which align with the implementation of the emerging Co-Service Models. The domain component refers to the shared concern or the common goal, the community component refers to the group of people connected by relationships and interactions, and the component of practice refers to the collective learning and resources developed and shared by the CoP (Seibert 2015; Thoma et al., 2018).

Consistent with the Diffusion of Innovations Theory and previous research on the development of promising co-service practices (Dearing & Cox, 2018; Johnson et al., 2017; Johnson et al., 2020; Kim et al., 2020; Rogers, 2003), the proposed Co-Service Models intervention is developed into a Virtual Community of Practice (vCoP). This vCoP would be comprised of VR professionals from each of the agencies, SVRA, AIVRP, VA-VR&E providing employment services for veterans of color with disabilities. A vCoP is comparable to a CoP that is conducted in-person, except that the participants in a vCoP interact in a virtual environment using online communication platforms (Thoma et al., 2018). The COVID pandemic of 2020 presented challenges with in-person gatherings that included limiting the number of people that could gather in-person and conducting meetings virtually. While intervention strategies such as social distancing, mask wearing, and vaccines have mediated these challenges, there are other benefits for utilizing a vCoP. A vCoP can greatly support communication, observation, and the exchange of communal resources (Thoma et al., 2018). A vCoP can reach people beyond their immediate geographic areas more often and conveniently, as well as provide online storage of meetings and records (de Carvalho-Filho et al., 2020). Implementing the proposed Co-Service Models utilizing a vCoP would enable the initiating of the Co-Service Models and contribute to sustaining them as well. Further, implementing the Co-Service Models via a vCoP is consistent with Diffusion of Innovations Theory because the vCoP is a viable communication channel adoption and sustained use of the co-service practices innovation (Goodyear & Casey, 2015; Rogers, 2003). Hurtubise et al. (2016) noted rehabilitation professionals recognize CoPs as

helpful tools of knowledge transfer, and virtual technology makes these CoPs more accessible.

The proposed vCoP for the emerging Co-Service Models is organized into the following phases: collaboration initiation phase, implementation phase, and the evaluation phase, which encompass the variables of the emerging Co-Service Models. The domain, community, and practice components and the Diffusion of Innovations Theory elements of innovation, communication channels, time, and social system merge to facilitate a vCoP for SVRA, AIVRP, and VA-VR&E professionals to provide employment co-service practices for veterans of color with disabilities.

Phase 1: Collaboration Initiation Phase

Rehabilitation professionals from SVRA, AIVRP, and VA-VR&E agencies would begin the collaboration with initial meetings of all rehabilitation professionals who have been identified as Innovators within each agency. These are individuals who tend to be unrestricted by conventional norms and are enthusiastic about the possibilities of the emerging Co-Service Models (Dearing & Cox, 2018). The idea of co-service practices would be introduced by Innovators in a meeting that would include all providers of VR services, administrators, and practitioners. The initial meetings would include discussion and exploration of the significance for each agency to engage in co-service practices. Mass media such as emails and agencies’ websites would be used to communicate information about the Co-Service Models and encourage rehabilitation professionals’ participation in the innovation. The information would include the date, time, purpose, and link to the online platform. Also, during the initiation of the collaboration, potential adopters will be identified using Rogers’ five classifications of adopters, previously discussed, to help determine the rate of adoption. In addition, Positions that are needed to help with diffusion of the innovation, such as administrative leadership positions are also identified apart from the individual Adopters. As the VR professionals communicate their perspectives, adopter status indicating how they will facilitate diffusion of the innovation of co-service practices would become clearer.

In subsequent meetings in the Collaboration Initiation Phase, Barriers and Opportunities would be assessed through brainstorming activities, whereby all ideas are received and recorded before being evaluated for relevance to the adoption of the innovation (Johnson & D’Lauro, 2018; Ritter & Mostert, 2018). Previous research (Johnson et al., 2017; Johnson et al., 2020) identified several barriers to implementing co-service practices in the VR agencies that would need to be assessed. As previously noted, these barriers were identified by VR professionals in these agencies and included organizational culture differences in each agency, organizational policies and procedures different in each agency, funding sources allow for and preclude specific types of service provision, different levels of professional competency of agency personnel, lack of cultural awareness and sensitivity of population served by each agency, inconsistent collaborations or partnerships, level of interpersonal relationships, lack of intentional focus on or development of interagency collaborations, and lack of diversity in the workforce. These identified barriers would be shared in the initial meetings with the goal of reframing them as Opportunities for further evaluation that minimize them as Barriers. Additionally,

both the Internal and External Practice Environments delineated in the proposed Co-Service Models are considered in assessing Barriers and Opportunities. The Internal Practice Environment would include barriers such as personnel and organizational culture and structure, and the External Practice Environment would include barriers such as funding sources and politics. Dearing and Cox (2018) characterize this phase as “purposive dissemination or designing for diffusion” (p. 188), which means activities are conducted to increase the positive perception and possibility of adoption of the innovation.

Prior to the Implementation Phase of co-service practices, meetings in the Collaboration Initiation Phase would include the development of procedural guidelines that would facilitate the agencies’ collaboration and engagement in co-service practices. Procedures & policies unique to each agency were identified in previous research (Johnson et al., 2017; Johnson et al., 2020) and included in the model as promising co-service practices. Thus, during the Collaboration Initiation Phase, the VR professionals would establish procedural guidelines that would include development of co-hierarchy and levels of co-responsibilities, conflict resolution procedures, determination of resource allocations, joint training manuals of co-service practices, and co-communications procedures. The collaboration and co-creation of procedures would contribute to mutual engagement between the VR agencies that increase the diffusion of adoption of co-service practices.

In sum, this phase corresponds to the domain and community components of the vCoP. Operating in the domain component, members begin to articulate and assimilate a shared mission through open discussion and exploration (Coffman et al., 2016; Seibert, 2015). Operating in the community component, members would consider additional rehabilitation professionals in the agencies, such as Opinion Leaders, who could influence the adoption of the Co-Service Models (Rogers, 2003; Zhang et al., 2015). Additional communication channels would be established to foster mutual engagement in the vCoP (Hurtubise et al., 2016; Smith et al., 2019; Thoma et al., 2018).

Phase 2: Implementation Phase

In the SVRA and VA-VR&E and AIVRP and VA-VR&E Co-Service Models, the central point is implementing the variable Promising Co-Service Practices identified as effective co-service practices in previous studies (Johnson et al., 2017; Johnson et al., 2020). As noted in the Co-Service Models, five categories of promising co-service practices were identified in those studies as contributing to successful employment outcomes for veterans of color with disabilities: job placement co-service practices, referral and information co-service practices, cultural/diversity co-service practices, co-service agreements, and co-agency procedures. Thus, the Implementation Phase is designed for implementing these Promising Co-Service Practices.

Implementation of the Promising Co-Service Practices in the Co-Service Models would include several steps: (a) members of the vCoP would share their level of current engagement in each of the co-service practices; (b) members of the vCoP would rate the importance of each co-service practice to their agencies; (c) members who experience the same rating on a co-service prac-

tice would co-develop a protocol for implementing that particular co-service practice; and finally, (d) newly developed co-service practices protocols would be implemented. In accordance with Diffusion of Innovations Theory, members of the vCoP must be allowed to develop and adapt their existing co-service practices to be implemented in the variable Implement Promising Co-Service Practices. This concept is important because the members of the vCoP are rehabilitation professionals who provide VR rehabilitation services, and their direct involvement and input in this phase would significantly contribute to the adoption of the emerging Co-Service Models (Rogers, 2003; Winsor et al., 2018).

The Implementation Phase corresponds to the practice component of the vCoP (Seibert, 2015). In addition to actually implementing the Promising Co-Service Practices, it is in the practice component that the rehabilitation professionals would engage in activities to develop an infrastructure that would contribute to the adoption and acceptance of the promising co-service practices to become standard, routine procedures and policy (Johnson et al., 2016). Furthermore, communication is a critical element in the Diffusion of Innovations Theory (Rogers, 2003). In the implementation phase, communication channels would involve networking formally and informally through peer-to-peer communication. Peer-to-peer communication would provide a facilitative forum for consultation, collaboration, and synergistic learning from peers (Johnson et al., 2016; Kim et al., 2020). Gullick and West (2016) characterized this phase as “designing for evolution,” or progress and growth of both members as effective collaborators and increased skills and depth of co-service practices that enhance employment outcomes for veterans of color with disabilities.

Phase 3: Evaluation Phase

The emerging SVRA, AIVRP, and VA-VR&E Co-Service Models were designed to assist VR professionals in achieving key short-term benefits and long-term outcomes identified in previous research (Johnson et al., 2017; Johnson et al., 2020). The short-term benefits of increased coordination, change in organizational culture, more services, policy changes, and access to resources constitute unique desired benefits for the rehabilitation agency professionals due to using the Co-Service Models. The long-term outcome of improved return-to-work outcomes constitutes a key consequence for veterans of color with disabilities due to Co-Service Model adoption by these agencies. Thus, the evaluation phase involves answering the question: How does the utilization of the emerging Co-Service Models impact these key benefits and outcomes? Evaluation surveys can be developed to measure short-term benefits that meet these goals and includes: (a) measuring the rate of occurrence of each of the short-term benefits for the rehabilitation professionals and (b) providing feedback to the rehabilitation professionals as to whether these short-term benefits enhance their ability to provide employment services for veterans of color with disabilities.

Regarding the long-term outcomes, each of the rehabilitation agencies already has internal mechanisms that measure successful employment outcomes (Winsor et al., 2018). The Virtual Community of Practice (vCoP) members could co-develop a method that combines the necessary information from each agency to provide a comprehensive measurement of the long-term outcomes. This

phase aligns with the Diffusion of Innovations Theory concept of relative advantage that posits the rate of adoption is impacted by the extent to which adopters perceive the innovation to be superior in some way to the current practices. Further, the evaluation phase corresponds to the central idea of Rogers' (2003) Diffusion of Innovations Theory, which is not to change the individuals to accept the innovation but instead shape the innovation to meet the needs of the members of the social system. The ultimate goal of Diffusion of Innovations Theory is to adopt, implement, and institutionalize the innovation (Johnson et al., 2016). Therefore, information gathered in the evaluation phase provides the opportunity for continued adaption of the co-service practices and/or parts of the model to achieve the desired short-term benefits and long-term outcomes.

Conclusion

The need for effective state and federal rehabilitation agencies (i.e., SVRA, AIVRP, and VA-VR&E) co-service practices and models to improve successful employment outcomes for veterans of color with disabilities has been well documented by ongoing race-based disparities (e.g., Moore et al., 2016; Moore & Wang, 2016). Research has, however, demonstrated that interagency collaborations have been found to have a positive effect on employment outcomes. Yet, this knowledge has not contributed to these agencies developing models representing clear and consistent procedures and policies of engagement in co-service practices. Indeed, a review of the literature revealed that there is a paucity of research about these models and collaborations between these VR agencies that indicates a lack of co-service models between SVRA, AIVRP & VA-VR&E agencies (Johnson et al., 2017; Johnson et al., 2020).

The SVRA and AIVRP, and VA-VR&E co-service conceptual frameworks are proposed to guide the establishment of co-service models that can help these agencies improve successful employment outcomes for veterans of color with disabilities. Moreover, the Diffusion of Innovations Theory is proposed as a conceptual framework for designing, implementing, and evaluating these co-service models between these agencies. Given the uniqueness of each of these agencies internal and external environments along with barriers and facilitators that influence engagement in co-service practices, the models have been designed to assist these agencies to identify, clarify, and mediate these factors so that they will adopt and adapt these Co-Service models to improve service provision and outcomes. Further, a Virtual Community of Practice (vCoP) is presented as a viable application of the Co-Service Models for these agencies.

Although the proposed Co-Service Models align well with the Diffusion of Innovations Theory that fosters the adoption and adaptation of the approaches, to date, no evaluative data has demonstrated the effectiveness of these Co-Service Models to provide short-term benefits, i.e., increased coordination, more resources and services, changes in organizational policies or to contribute to the long-term goal of increased employment outcomes. The implementation and evaluation of these Co-Service Models would advance the current state-of-science on the alleviation of employment disparities among veterans of color with disabilities. Addi-

tionally, future research could address the effect VR counselors' caseloads could have on adopting the Co-Service Models. This question could be specifically addressed in the variable Agency Assess Barriers and Opportunities and give a clearer picture of facilitators and barriers to adoption from the perspective of the VR counselors. Consequently, SVRA, AIVRP, and VA-VR&E practitioners would be provided with innovative interagency collaborations to further their mission of providing effective employment services. Thus, future researchers should explore and evaluate the efficacy of these Co-Service Models as a new paradigm for engaging in co-service practices across these VR agencies.

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National Benchmark Study of Employment Equity Among Multiply Marginalized Persons of Color with Disabilities During the COVID-19 Pandemic: A Bootstrap Approach

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BACKGROUND: Research examining state vocational rehabilitation agency (SVRA) sponsored service patterns during the COVID-19 pandemic is needed to improve employment outcomes among multiply marginalized persons of color with disabilities (i.e., African Americans, Asian Americans, Native Americans or Alaska Natives, Latinx, and Native Hawaiians/Pacific Islanders). Scarce attention has been paid to examining outcome inequities in the crisis.

OBJECTIVE: This study applied a stratified bootstrap data expansion approach to assess the relationship between race/ethnicity, gender, level of educational attainment at closure and employment outcomes among target group members.

METHODS: National fiscal year (FY) 2019 Rehabilitation Services Administration (RSA)-911 case records (N =114,229) closed between January 20, 2020 (date of first reported COVID-19 infection in the U.S.) to June 30 2020 were extracted and re-sampled across multiple trials using bootstrap procedures to increase logistic regression model accuracy.

RESULTS: The findings indicated that African Americans, Asian Americans and Native American or Alaska Natives were statistically significantly less likely to achieve successful employment than non-Latinx Whites. Success probabilities in the COVID-19 pandemic were 'poorest' for Native American or Alaska Native VR consumers followed by African Americans, Asian Americans, Latinx, non-Latinx Whites, and then Native Hawaiians/Pacific Islanders. African Americans and Native Americans or Alaska Natives were more often closed unsuccessful because they could not be located when compared to non-Latinx Whites.

CONCLUSIONS: These findings call for new targeted SVRA service initiatives.

Keywords: COVID-19 Pandemic, Multiply Marginalized People of Color with Disabilities, Employment Outcomes, Bootstrap Data Expansion

More than 13 million multiply marginalized people of color with disabilities resided in the United States in 2019 of which 44.06% were African American, 41.47% Latinx, 10.30% Asian American, 3.67% Native American or Alaska Native, and .5% Native Hawaiian/Pacific Islander (American Community Survey [ACS], 2019). Appraised disability prevalence for African Americans (14.1%) and Native Americans or Alaska Natives (17.2%) exceeded the national average (12.7%) as well as that of Whites (13.2%). Individuals from these communities of color are more likely to contract the COVID-19 virus (Golestaneh et al., 2020; Holmes et al. 2020; Moore et al., 2020; Muñoz-Price et al., 2020) and disproportionately experience deleterious impacts across increased illness and hospitalizations (Karaca-Mandic et al., 2021; Raifman & Raifman, 2020; U.S. Centers for Disease Control and Prevention [CDC], 2020), mortality (APM Research Lab Staff, 2021; Chicago Urban League, 2020), and disability incidence (i.e., mental health issues) (McKnight-Eily et al., 2021; Taquet & Harrison, 2021).

People of color are more likely to have conditions associated with increased risk of illness from COVID-19 than Whites (Raifman & Raifman, 2020). The U.S. Centers for Disease Control and Prevention (CDC) evaluated data from 580 patients hospitalized with lab-confirmed COVID-19 and found that 33% were African Americans compared to 18% in the community (Garg, 2020). Conversely, this agency reported that 45% of individuals for whom race or ethnicity data was available were White compared to 55% of individuals in the surrounding community. In a weekly report for the period ending June 27, 2020, the CDC indicated that of the 33,277 laboratory-confirmed COVID-19-associated hospitalized cases, 31,486 (94.6%) had information on race and ethnicity. Of these cases, Native Americans or Alaska Natives, African Americans, and Latinx had an age-adjusted hospitalization rate approximately 5.7 times, 4.7 times, and 4.5 times that of Whites, respectively (CDC, 2020). Findings from APM Research Lab's [Color of Coronavirus project](#), which documented lives lost to COVID-19 by racial and ethnic group, revealed that people of color experienced higher nationwide mortality rates in 2020 than Whites (Egbert & Liao, 2020). Age-adjusted mortality rates among African Americans and Latinx were found to be 3.6 and 3.2 times higher, respectively, than for the non-Latinx Whites. Moreover, Native Americans, African Americans and Latinx individuals were reported to be at least 2.7 times more likely to die of COVID-19 than Whites. Similarly, Pacific Islanders were 2.3 times more likely to die of the disease than their White counterparts. The report noted that one in 475 Native Americans have died from the virus since the start of the pandemic (Egbert & Liao, 2020).

Healthcare access barriers during the pandemic have further exacerbated disability prevalence (e.g., mental disabilities), making timely and appropriate treatment difficult. COVID-19 has been linked to a higher risk for later mental health (e.g., anx-

xiety, mood disorders, substance abuse disorders, and insomnia) and neurological disorders (McKnight-Eily et al., 2021; Taquet & Harrison, 2021). McKnight-Eily and colleagues (2021) examined racial and ethnic disparities in the prevalence of stress and worry, mental health conditions, and substance use among adults in the U.S. and found that symptoms of current depression were reported 59% more frequently by Latinx adults (40.3%) than by non-Latinx Whites (25.3%). Estimates of self-reported suicidal thoughts/ideation among Latinx (22.9%) were four times those among African Americans (5.2%) and Whites (5.3%) and approximately twice those of multiracial and non-Latinx persons of other races/ethnicities (8.9%). Increased or newly initiated substance use was reported among 36.9% of Latinx respondents, compared with 14.3%–15.6% among all other respondents. Even prior to the COVID-19 pandemic, mental health needs among people of color were seldom met. In 2019, for instance, an estimated 73% of Asian Americans and Pacific Islanders, 69% of African Americans, and 67% of Latinx with a mental illness did not receive mental health treatment (Agency for Healthcare Research and Quality, 2020).

Notwithstanding health disparities that most people of color may face in general, those with disabilities have experienced additional inequities in employment during the pandemic as a result of their disability and race; in effect they face “double jeopardy” due to these multiple marginalized statuses (Moore et al., 2020). Unsurprisingly, they have suffered the highest rates of job losses. In 2020, for example, the jobless rates for Latinx (16.8%), African Americans (16.3%), and Asian Americans (15.7%) with a disability were higher than the rate for Whites with a disability (11.6%) (U.S. Bureau of Labor Statistics [BLS], 2021). According to the National Disability Institute (2020), between January and May 2020, African Americans with disabilities suffered the highest rate of losses. Specifically, of the estimated 3.3 million that were of working age, 750,000 were employed and at-work in January. By April, 44% of them were no longer working. Similarly, 22% of Latinx workers with disabilities lost their jobs between January and April 2020. In comparison, 20 percent of all workers with disabilities were out of work in May. This disparity, although not surprising, reveals the unique challenges faced by people of color with disabilities in the context of the COVID-19 sequelae.

As job losses worsen due to the crisis, members of these target disability populations may find it difficult to gain employment post-pandemic (Moore et al., 2020). Unemployment or losing a job can have several negative ripple effects such as eviction, loss of health insurance, and exposure to mental health vulnerabilities. According to the social determinants of health (SDOH) perspective, social and economic factors (e.g., educational attainment, employment and income) have a greater influence on health than clinical care (Krist et al., 2019). In particular, multiply marginalized persons of color with disabilities experience educational attainment inequities (Bisesti & Landes, 2021), which makes it less likely for them to access quality healthcare (Onyeabor, 2016) and find employment that pays a living wage during the pandemic (Maroto et al., 2021). Therefore, an immediate need exists to examine state vocational rehabilitation agency (SVRA) services to multiply marginalized consumers of color with disabilities seeking employment during the pandemic. SVRAs provide various employment support services such as assessment to determine needed

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services, Individualized Plans of Employment (IPE), vocational or academic training, job placement service, vocational counseling, referrals, an assistive technology services (Johnson et al., 2017). To be eligible, an individual must have a physical or mental impairment that substantially impedes employment, which is considered a major life activity, and requires and can benefit from VR services to become gainfully employed (Congressional Research Service, 2014).

Purpose of the Study

To date, scarce attention has been given to investigating employment outcome statuses between multiply marginalized persons of color with disabilities and Whites with disabilities within SVRA context during the COVID-19 pandemic. This study will contribute toward filling this research gap in the employment domain. Additionally, this analysis is a methodological replication (i.e., bootstrap approach) of the Moore and Wang (2016) study that used fiscal year (FY) 2013 Rehabilitation Services Administration (RSA)-911 data to examine, identify and describe national and RSA regional service patterns and disparities in employment outcome rates based on race/ethnicity, gender, and level of educational attainment at closure among SVRA consumers with a signed Individualized Plan for Employment (IPE). While their study targeted U.S. Armed Forces veterans with disabilities, this current inquiry contributes new knowledge to the field about multiply marginalized persons of color with disabilities in general. The generated national profile was broken out by RSA Regions in order to align with the Moore and Wang replication model and assess continuous disparity phenomena although the structure for these regions no longer exist. Employment outcome rates between African Americans, Asian Americans, Latinx, Native Americans, Native Americans or Alaska Natives, Native Hawaiians/Pacific Islanders and non-Latinx Whites were compared across the 10 RSA regions, and the national fiscal year (FY) 2019 RSA-911 database benchmark. RSA regional cataloging was accessed through the following website; <http://www2.ed.gov/students/college/aid/rehab/catrcep.html>. In replicating the Moore and Wang (2016) bootstrap methodology, the national benchmark was calculated as the employment outcome rate for all persons regardless of race or ethnicity closed as successfully employed or not successfully employed. The following research questions were addressed:

Research Question 1: What is the national and RSA regional profile (i.e., racial/ethnic cohort frequencies and percentages) of employment outcomes for African Americans, Asian Americans, Latinx, Native Americans or Alaska Natives, Native Hawaiians/Pacific Islanders and non-Latinx Whites with a signed Individualized Plan for Employment (IPE)?

Research Question 2: What are the successful employment probabilities between African Americans, Asian Americans, Latinx, Native Americans or Alaska Natives, and Native Hawaiians/Pacific Islanders and non-Latinx Whites with a signed Individualized Plan for Employment (IPE)?

Research Question 3: Are gender, race, and level of educational attainment at closure significantly related to successful employment outcomes?

Research Question 4: What are the reasons for case closures for unsuccessful employment for African Amer-

icans, Asian Americans, Latinx, Native Americans or Alaska Natives, and Native Hawaiians/Pacific Islanders and non-Latinx Whites with a signed Individualized Plan for Employment (IPE)?

Method

Descriptive and multivariate statistics used in the Moore and Wang (2016) study were replicated to analyze case records extracted from the national FY 2019 RSA-911 database. First, service access and successful employment frequencies and percentage rates were generated, compared and reported for the six ethnic/racial comparison groups. Next, bootstrap resample techniques were employed to increase the efficiency of validation procedures for predictive logistic regression analyses, and the final predictive model was used to evaluate successful employment rates across the racial/ethnic, gender, and level of educational attainment at closure variables. Logistic regression is appropriate for analyzing the relationship between two or more predictor variables and a categorical level dependent variable (Hosmer et al., 2013). Although the overall number of cases for the population was large, some subdivided population groups such as racial/ethnic were small and unbalanced (i.e., Native Hawaiian/Pacific Islander, Native American or Alaskan Native, and Asian American) as shown in Table 1. Developing models with such highly imbalanced subdivided populations can present challenges for calculating accurate estimators (e.g., logistic regression odds ratios) (He & Garcia, 2009). Bootstrap approximation of the distribution of standardized sample mean is asymptotically more accurate than approximation by the limiting normal distribution (Singh, 1981). Pons' (2007) study tested the efficiency of various statistical procedures to estimate such subdivided populations, and his results suggested that second order asymptotics bootstrap estimates provide good accuracy and consistent estimators. This study used a two-stage stratified bootstrap with replacement sampling where logistic regression was subsequently used to estimate odd ratio of predictors. The Statistical Analysis System (SAS), desktop version 9.4, was used in these calculations (SAS Institute Inc., 2018).

Sample

The national FY 2019 RSA-911 database (N = 484,463) was

Table 1

Demographic and outcomes of RSA-911

Demographic information	Successfully Employed	Not Successfully Employed
Race or Ethnicity		
African American	10694	16671
Asian American	774	928
Latinx	7081	8619
Native American or Alaska Native	372	675
Native Hawaiian/Pacific Islander	108	124
White	31866	36738
Gender		
Male	28404	35035
Female	22361	28598
Education at Closure Status		
High School Diploma or Less	36038	50600
Some Post-Secondary Education	8197	7982
Associate's Degree/Voc Tech	2080	1846
Bachelor's Degree or Higher	4521	3217

used in this analysis. The overall sample consisted of 114,229 VR consumers who were served by the 56 state and territorial VR agencies across the nation during Fiscal Year (FY) 2019, and whose cases were closed between January 20, 2020 (date of the first reported COVID-19 infection in the U.S.; Burke et al., 2020) and June 30, 2020, and (a) identified as African American (1 = yes and 0 = no), Asian American (1 = yes and 0 = no), Latinx (1 = yes and 0 = no), Native American or Alaska Native (1 = yes and 0 = no), Native Hawaiian/Pacific Islander (1 = yes and 0 = no) or White (1 = yes and 0 = no), and (b) reported as having a developed signed Individualized Plan for Employment (IPE); i.e., closed as successfully employed (individual exited after an IPE in competitive and integrated employment or supported employment [type of exit code 6]) or closed as not successfully employed (individual exited after an IPE in noncompetitive and/or nonintegrated employment [type of exit code 5], and individual exited after an IPE without employment outcome [type of exit code 4]). Cases in which a person identified as Latinx and another race were coded as Latinx. All other cases where an individual identified as more than one race were excluded from the analysis. Of these 114,229 VR consumers, 68,334 (59.82%) were non-Latinx White, 27,305 (23.90%) African American, 15,628 (13.68%) Latinx, 1,695 (1.48%) Asian American, 1,037 (0.91%) Native American or Alaska Native, and 230 (0.2%) Native Hawaiian/Pacific Islander. Overall, males accounted for 63,335 (55.45%) of participants while there were 50,894 (44.55%) females in the study sample.

A race by gender breakout indicated that the sample included 38,406 (33.62%) non-Latino White males and 29,928 (26.20%) non-Latina White females; 14,531 (12.72%) African American males and 12,774 (11.18%) African American females; 8,707 (7.62%) Latino males and 6,921 (6.06%) Latina females; 1,003 (0.88%) Asian American males and 692 (0.61%) Asian American females; 555 (0.49%) Native American or Alaska Native males and 482 (0.42%) Native American or Alaska Native females; and 133 (0.12%) Native Hawaiian/Pacific Islander males and 97 (0.08%) Native Hawaiian/Pacific Islander females. A plurality of these VR consumers (N = 86,458 or 75.69%) at closure possessed a high school diploma/equivalency or less while those with some post-secondary education (N = 16,136 or 14.13%), an associate's degree/vocational technical certificate (N = 3,919 or 3.43%), and a bachelor's degree or higher (N=7,716 or 6.75%) comprised the remainder of the sample. The total sample was utilized to generate the analysis and national profile of employment outcome rates.

Key Observations-Profile

Several observed differences across RSA Regions and the nation emerged as key findings and could have future implications for multiply marginalized persons of color with disabilities and the state-federal vocational rehabilitation program that serves them. Several of these differences can be seen in the tables and figures presented and do not require additional response. As such, the discussion will include only a select number of key observations. First, as shown in Table 2, nationally African Americans (39.08%), Asian Americans (45.48%), Latinx (45.10%), and Native Americans or Alaska Natives (35.53%) were less likely to achieve successful employment than non-Latinx Whites (46.45%). This finding represents a 7.37% and 10.92% national disparity for African Americans and Native Americans or Alaska Natives, respectively. Second, some differences in employment outcome rate comparisons between target groups across RSA Regions can be observed from the results. The national FY 2019 RSA-911 database benchmark for successful employment outcomes (i.e., cases closed between January 20 and June 30, 2020) was calculated to be 44.39%. Noteworthy, African Americans, Asian Americans, Latinx and Native Hawaiians/Pacific Islanders outcome rates were found to be below this benchmark across 7, 3, 6, and 5, respectively, of the 10 regions while non-Latinx Whites were below this criterion in only 3 of the 10 regions. Native Americans or Alaska Natives outcome rates were below the national benchmark across all 10 regions.

Consumer Characteristics and Employment Outcomes

The association between select characteristics (i.e., race/ethnicity, gender, education level at closure) was tested using multinomial logistic regression and applied bootstrap resample techniques to increase the efficiency of interval validation procedures (Gude et al., 2009; Steyerberg et al., 2001). The guiding procedures are reflected in Figure 2. The algorithms and detailed description of the procedures employed to bootstrap replicate, resample, build, and test models follow.

Procedure 1

Selected case records (n=50, 100, 500 each stratum) were stratified by race, based on the overall inclusion criteria, representing the total sample (N=114,299) with replacement as a sample. The PROC SURVEYSELECT procedure with ethnicity as the

Table 2

National RSA-911 Data on VR consumers' Access and Employment Outcome

State/Territory (VR) Region	Race/Ethnicity	Access Comparison after IPE sign		Successful Employment	
		f	%	f	%
Region I	African American	471	9.48	192	40.76 ^{ab}
	Asian American	86	1.73	40	46.51
	Latinx	466	9.38	191	40.99 ^{ab}
	NA/AN	30	0.6	11	36.67 ^{ab}
	NHPI	4	0.08	2	50.00
	White	3912	78.73	1742	44.53
Region II	African American	2454	20.51	660	26.89 ^{ab}
	Asian American	210	1.76	72	34.29 ^{ab}
	Latinx	3791	31.69	1739	45.87
	NA/AN	57	0.48	14	24.56 ^{ab}
	NHPI	15	0.13	6	40.00 ^a
	White	5437	45.44	1955	35.96 ^a
Region III	African American	4072	31.14	1273	31.26 ^{ab}
	Asian American	185	1.41	63	34.05 ^{ab}
	Latinx	608	4.65	216	35.53 ^{ab}
	NA/AN	49	0.37	12	24.49 ^{ab}
	NHPI	9	0.07	1	11.11 ^{ab}
	White	8155	62.36	3363	41.24 ^a
Region IV	African American	10453	36.76	4361	41.72 ^{ab}
	Asian American	177	0.62	76	42.94 ^{ab}
	Latinx	2161	7.60	871	40.31 ^{ab}
	NA/AN	149	0.52	57	38.26 ^{ab}
	NHPI	31	0.11	13	41.94 ^{ab}
	White	15466	54.39	7108	45.96
Region V	African American	3989	21.09	1530	38.36 ^{ab}
	Asian American	265	1.40	128	48.30 ^b
	Latinx	1159	6.13	453	39.09 ^{ab}
	NA/AN	143	0.76	51	35.66 ^{ab}
	NHPI	19	0.10	12	63.16
	White	13343	70.53	6555	49.13
Region VI	African American	3331	24.36	1589	47.70 ^b
	Asian American	155	1.13	89	57.42
	Latinx	3378	24.70	1747	51.72 ^b
	NA/AN	195	1.43	62	31.79 ^{ab}
	NHPI	31	0.23	18	58.06
	White	6586	48.16	3524	53.51

strata in SAS version 9.4 was applied in this procedure (SAS Institute Inc., 2016).

Procedure 2

Sample sizes 6*n with B replicate were created, and then a logistic regression with variable selection procedure was applied to each replicate. Logistic regression is a form of statistical modeling and is appropriate for analyzing categorical outcome variables (Agresti, 2013; Chatterjee & Hadi, 2013; Hosmer Jr & Lemeshow, 2004). The PROC LOGISTIC procedure in SAS version 9.4 was applied in these procedures (Stokes et al., 2012). The data description of the three explanatory variables and the dependent variable is provided in Table 3.

A logistic regression model (1) was conducted on the selected sample with selected predicted variables to find the best fitting model and to estimate the vector $\hat{\beta}$

$$\text{logit}(P(Y=\text{closed employed}|X_1, \dots, X_p)) = \beta_0 + \beta_1 X_1 + \dots + \beta_p X_p + \epsilon, \quad (1)$$

where β ($=1, 2, \dots$) are the coefficients estimated using maximum likelihood estimation., X_i ($i=1, 2, \dots, p$) are explanatory variables, and is ϵ error. A predicted logit was obtained from the solved logistic regression equation by substituting the explanatory variables' value into the sample estimate of the logistic regression equation

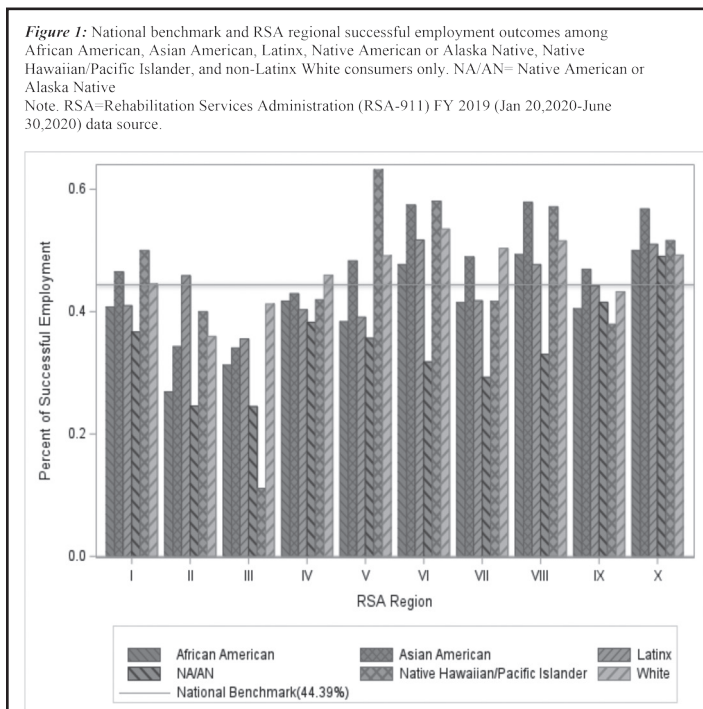
$$\text{logit}(P) = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \dots + \hat{\beta}_p X_p. \quad (2)$$

The predicted probability is given by

$$P = \frac{\exp(\text{logit})}{1 + \exp(\text{logit})} \quad (3)$$

This value which represents VR consumer's successful employment serves as the binomial distribution of Y at values of X

Next, a three step model selection process was used to determine the relationship of the independent variables to the dependent variables of intention. The following steps, as reflected in the scenario presented in Table 4, (sample size=300 (50*6), and n=50) with replicate=10 (table 4) were used to develop and test the models.

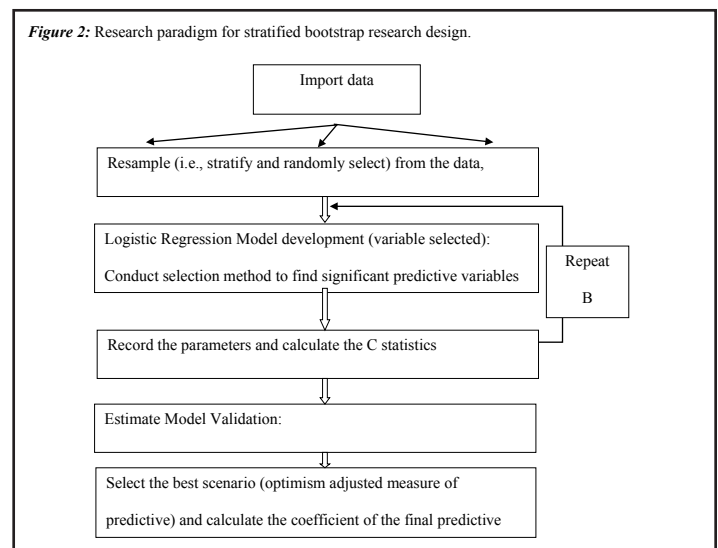


Step 1. To develop Model 1, the following null hypothesis H_0 was tested: There is no significant difference in successful employment outcome rates between racial and ethnic target groups. If the p-value of the Wald Chi-square test was less than 0.10 then the null hypothesis would be rejected, otherwise the race/ethnicity variable from Model 1 would be removed. The logistic regression results, $\chi^2 = 20.39, df = 5, p < 0.10$, indicated that race/ethnicity was a significant predictor in Model 1 for this bootstrap sample.

Step 2. To develop Model 2, the gender variable was entered in Model 1. The following null hypothesis H_0 was tested: Model 1 (reduce model) is an adequate model. The alternative hypothesis H_1 was: Model 2 (full model) is an adequate model. If the p-value in the Wald Chi-square test was less than 0.10, yielded significance would provide the research team with the confidence to reject the null hypothesis, and Model 2 would be a more adequate fit to the data. The logistic regression results, $\chi^2 = 7.6, df = 1, p < 0.10$, indicated that gender was a significant predictor in Model 2.

Step 3. To develop Model 3, the level of educational attainment at closure (Edu) variable was entered in Model 2. The following null hypothesis H_0 was assessed: Model 2 (reduced model) is an adequate model. The alternative hypothesis H_1 was: Model 3 (full model) is an adequate model. Similar to step 2, if the p-value of the Chi-square test was less than 0.10 then the null hypothesis would be rejected and Model 3 would be a more adequate fit for the data. Chi-square results, $\chi^2 = 21.70, df = 3, p < 0.10$, yielded significant confidence to reject the null hypothesis indicating that

Description on variables		
Variable	Type & Definition	Characteristic
Y	Dependent variable	26=successfully employed 28= not successfully employed
Gender	Dummy variable	1=Male 2=Female
Ethnic	Categorical variable Race/Ethnicity	1=African American 2=Asian American 3=Latinx 4=Native American or Alaska Native 5=Native Hawaiian/Pacific Islander 6=White
Edu	Categorical variable Level of educational attainment at closure	1=high school diploma/equivalency or less 2=some post-secondary education 3=associate's degree/vocational technical certificate 4=bachelor's degree or higher



Model 3 made the best fit to the data when compared with Model 2. Overall, Model 3 made the best fit to the data in comparison with Models 1 and 2 in this bootstrap sample.

Through this process the best fitting model was identified in this bootstrap sample, and then recorded the coefficient of the best model.

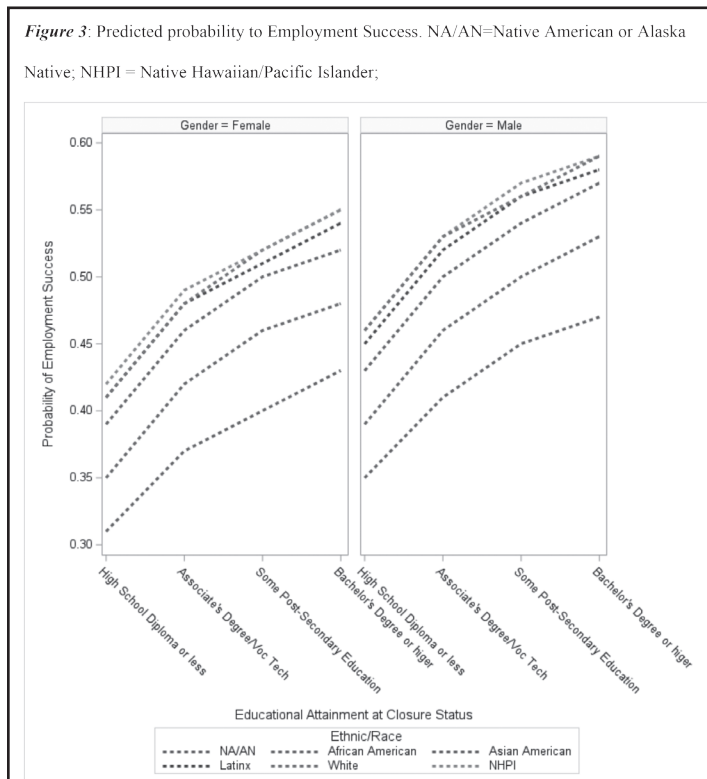
Procedure 3

The above procedure was repeated B (30, 50 and 100) times to obtain the bootstrap estimates of parameters (Lankham & Slaughter, 2020). The mean of each of the parameter estimates was then computed, which was denoted as $\hat{\beta}$ for the predictive model. The bootstrap resample technique was used not only to refine the selections of predictive variables but also to increase the efficiency of internal validation procedures for the final predictive logistic regression model (Duwe & Freske, 2012; Taylor et al., 2008).

Procedure 4

Model validation was estimated as the next procedure. The c-statistics were located in the same area under the receiver operating characteristic curve and was used to measure how well the model discriminated between observed data at different levels

Model	Model Effects	Chi-square	Degrees of Freedom	P-value
Model 1	intercept , Ethnic	20.39	5	0.0011
Model 2	intercept , Ethnic, Gender	7.6	1	0.0058
Model 3	intercept, Ethnic, Gender and Edu	21.70	3	<0.001



of the outcome. The following steps were used to model validate each scenario (Efron & Tibshirani, 1994; Harrell et al., 1996; Ye & Zhao, 2010).

Step 1: The logistic regression model was fitted into the original data, and estimate the c-statistic, denote as C_{app} .

Step 2: For $b=1, 2, \dots, B$:

1. A bootstrap sample was stratified and selected with replacement from the original data using race/ethnicity as a stratum with size n for each stratum.
2. The logistic regression model was fitted in the bootstrap dataset, and estimated C using this fitted model and this bootstrap dataset. The estimate C by $C_{b,boot}$ was denoted.
3. $C(C_{b,orig})$ was estimated by applying the fitted model from the bootstrap dataset to the original dataset.

Step 3: The estimate of optimism

$O = B^{-1} \sum_{b=1}^B C_{b,boot} - C_{b,ori}$ was calculated.

Step 4: The optimism adjusted measure of predictive ability as was $C_{app} - O$ calculated.

Procedure 5

The largest optimism adjusted measure of predictive ability was selected (see table 5) and then the $\hat{\beta}$ was calculated as the final predictive model. The best fitting model shown in Table 6 was used to analyze the data to address research question #3.

Results

Logistic regression results indicated that race, African American versus non-Latinx White, (OR = 0.777; 95% confidence interval [CI] = [.758-.797], $p < .05$), Asian American versus White, (OR = 0.930; 95% confidence interval [CI] = [.907-.954], $p < .05$), Native American or Alaska Native versus non-Latinx White, (OR = 0.644; 95% confidence interval [CI] = [.628-.661], $p < .05$) and

Sample size for each stratum	B=30	B=50	B=100
50	0.4818	0.4905	0.4841
100	0.5133	0.5196	0.5174
500	0.5468	0.5468	0.5476

Closed Status	B	Odd Ratio	95% Confidence Limit	p-value
Intercept	0.0395			
Ethnic=1 vs Ethnic=6	-0.2518	0.777	0.758 0.797	<.0001
Ethnic=2 vs Ethnic=6	-0.0724	0.930	0.907 0.954	<.0001
Ethnic=3 vs Ethnic=6	-0.0112	0.989	0.964 1.014	0.3829
Ethnic=4 vs Ethnic=6	-0.4393	0.644	0.628 0.661	<.0001
Ethnic=5 vs Ethnic=6	0.0356	1.036	1.011 1.062	0.0052
Gender=1 vs Gender=2	0.1822	1.200	1.182 1.218	<.0001
Edu=2 vs Edu=1	0.4107	1.508	1.477 1.539	<.0001
Edu=3 vs Edu=1	0.2679	1.307	1.255 1.362	<.0001
Edu=4 vs Edu=1	0.5296	1.698	1.648 1.750	<.0001

gender, male versus female, (OR = 1.200; CI= [1.182-1.218], $p < .05$) were significant predictors of successful employment. The odds ratios (OR) or effect sizes for the final predictive model are shown in Table 6 and provide the estimated coefficients that predict successful employment outcomes. The coefficients (B) were the log odds of the event occurring (i.e., change in the log odds associated with a one-unit change in the independent variable). All things being equal, the OR coefficient indicated that a non-Latinx White individual was 1.29 (1/.777) times, 1.08 (1/0.930) times, and 1.55 (1/0.644) times more likely to achieve successful employment compared to an African American, Asian American and Native American or Alaska Native, respectively. Similarly, a male was 1.20 times more likely to achieve successful employment compared to a female.

In addition, results yielded significance for level of educational attainment and employment success; bachelor’s degree or higher vs high school diploma/equivalency or less (OR = 1.698; CI=[1.648-1.750], $p < .05$), some post-secondary education versus high school diploma/equivalency or less (OR = 1.508; CI=[1.477-1.539], $p < .05$), associate’s degree/vocational technical certificate versus high school diploma/equivalency or less (OR = 1.307; CI=[1.255-1.362], $p < .05$). In short, a VR customer with a bachelor’s degree or higher was 1.70 times more likely to achieve successful employment compared to a VR customer who had a high school diploma/equivalency or less. Similarly, a customer with some post-secondary education was 1.51 times more likely to achieve successful employment compared to a one who had high school diploma/equivalency or less. Finally, a VR customer with an associate’s degree/vocational technical certificate was 1.31 times more likely to achieve successful employment compared to one who had a high school diploma/equivalency or less.

The predicted probabilities for the race/ethnicity, gender, and level of educational attainment at closure variables are presented in Figure 3. Overall, the analysis yielded the following successful employment probabilities:

1. Native Hawaiians/Pacific Islanders had the highest probability for successful employment followed by non-Latinx White, Latinx, Asian Americans, African Americans and Native Americans or Alaska Natives for fixed gender and educational attainment at closure level variables.
2. Males possessed a higher probability for achieving successful employment outcomes compared to females.
3. For all racial/ethnic target groups, individuals who had a bachelor’s degree or higher had the highest probability for successful employment followed by those with some post-secondary education, associate’s degree/vocational technical, and or a high school diploma or less.

Reasons for Case Closure

Data were analyzed to determine the reasons consumers were unsuccessful in obtaining employment (i.e., the 63,755 consumers who were not successfully employed). Table 7 shows observations for the specific reasons why these individuals were not successfully placed into employment. The two most frequent reasons observed were “Unable to Locate or Contact” and “No longer Interested in Receiving Services or Further Services”. Of note, a higher proportion of African Americans (37.29%), Latinx (41.33%) and Native Americans or Alaska Natives were closed unsuccessful because they could not be located when compared to non-Latinx White consumers (32.42%). Contrary, a higher percentage of non-Latinx Whites (43.09%) were closed due to them no longer being interested in receiving services in comparison to African Americans (40.54%), Latinx (39.03%), Native Americans or Alaska Natives (41.48%) and Native Hawaiians/Pacific Islanders (41.13%).

Discussion

In this study, the association between race/ethnicity, gender, and level of educational attainment and employment outcomes was examined among people with disabilities served by SVRAs during the COVID-19 pandemic. The results showed that African Americans, Asian Americans, Native Americans or Alaska Natives, females, and those with an educational attainment of a high school diploma/equivalency or less were statistically significantly less likely to achieve successful employment compared their respective reference groups. African Americans and Native Americans or Alaska Natives were more often closed unsuccessful because they could not be located when compared to non-Latinx Whites. Moreover, predictive probability results yielded new field information and indicated that (a) Native Americans or Alaska Natives had the ‘poorest’ successful employment probabilities followed by African Americans, Asian Americans, Latinx, non-Latinx Whites, and then Native Hawaiian/Pacific Islanders, (b) female consumers possessed lower employment success probabilities than their male counterparts, and (c) regardless of the race/ethnicity and gender, those with a high school diploma or less had the lowest probability

Table 7
Reason for case closures for unsuccessful participants (n = 63,755)

Note: f=frequency; %=percentage of unsuccessful exit reason in each group; NA/AN = Native American or Alaska Native;

Exit Reason	African American		Asian American		Latinx		NA/AN		NHPI		White	
	f	%	f	%	f	%	f	%	f	%	f	%
Health/Medical	275	1.65	29	3.13	155	1.80	22	3.26	3	2.42	882	2.4
Death of Individual	222	1.33	8	0.86	82	0.95	7	1.04	1	0.81	466	1.27
Criminal Offender	145	0.87	2	0.22	38	0.44	6	0.89	5	4.03	290	0.79
No Impediment to Employment	1	0.01	1	0.11	3	0.03	0	0	0	0	5	0.01
Disability Too Significant to Benefit from Services	100	0.6	14	1.51	62	0.72	11	1.63	0	0	287	0.78
Transferred to Another Agency	132	0.79	31	3.34	103	1.2	12	1.78	4	3.23	390	1.06
Extended Employment	268	1.61	14	1.51	86	1	10	1.48	2	1.61	1241	3.38
Unable to Locate or Contact	6216	37.29	272	29.31	3562	41.33	263	38.96	40	32.26	11912	32.42
No Longer Interested in Receiving Services or Further Services	6759	40.54	400	43.1	3364	39.03	280	41.48	51	41.13	15829	43.09
Other Reasons	2553	15.31	157	16.92	1164	13.5	64	9.48	18	14.53	5436	14.8

NHPI=Native Hawaiian/Pacific Islander Other Reasons includes Reason for Exit Code: 1. Individual is No Longer Available for Services Due to Residence in an Institutional Setting Other Than a Prison or Jail; 4. Reserve Forces Called to Active Duty; 5. Foster Care; 6. Ineligible; 8. No Disabling Condition; 10. Does Not Require VR Service; 12. No Long-Term Source of Extended Services Available; 15. Extended Employment; 19. All Other Reasons

followed by those with an associate's degree/vocational technical certificate, some post-secondary education, and bachelor's degree or higher.

The results on reasons for unsuccessful closure during the pandemic in the current analysis might offer some evidence for explaining differential employment outcome statuses across the racial/ethnic groups. The current findings indicated that African Americans and Native Americans or Alaska Natives were more often recorded as unable to locate as a rationale for case closure for unsuccessful participants than non-Latinx Whites. Consequently, African American, and Native American or Alaska Natives consumers could not be contacted to receive services that could have helped facilitate their successful employment aspirations. Preeminent contributors to unstable and substandard housing and the lack of official residences among multiply marginalized persons of color with disabilities are Social determinants of health (SDOH) factors, which are grounded in long-standing intersectional and multiple levels of systemic and institutional discriminatory policies and practices (Jones, 2014; Moore et al., 2020). Economic, education, and neighborhood and built environment contexts of SDOH all intersect to create instability in housing, which is a key factor to maintaining a residence and address where these consumers can be located to receive employment support services.

In order to maintain a residence, an individual must have income or at the least be a part of a supportive family unit that has the financial means to maintain adequate housing. People of color with disabilities more often experience poverty (Blacksher & Valles, 2021; Wade, 2017), which creates a situation whereby they or their family members don't always possess the economic resources to maintain good housing. The current results indicate that educational attainment matters as those consumers with lesser levels were less likely to achieve successful employment. Income levels also increase with educational attainment (Wolla & Sullivan, 2017), and thus higher wage earnings are more often stable in the housing arena and less likely to experience homelessness (Byrne et al., 2021). One's own built neighborhood/environment and its proximity to available healthy food options (i.e., groceries), and accessible public transportation and ample healthcare infrastructure and providers reflects a standard of living. Substandard housing often limits healthy food access options and access to healthcare, which can lead to co-morbidities, while transportation is often needed to obtain and maintain competitive integrated employment; all limiting income that affect housing stability. There may be a need for new public employment support service models that account for intersectionality of SDOH factors during the pandemic to determine the educational, nutritional and health entity proximity, and transportation needs of target group members for achieving their IEP objectives.

Native Americans or Alaska Natives experienced the 'poorest' employment outcomes of any racial/ethnic population during the COVID-19 crisis, and this finding may warrant additional coordinated co-service efforts between SVRAs and American Indian Vocational Rehabilitation Programs (AIVRPs- Section 121 Programs) across the nation. The Rehabilitation Services Administration (RSA) might consider developing new rapid response initiatives

that focus on enhancing successful employment outcome rates among this target population. Johnson and her colleagues (2020) at the RRTC on Research and Capacity Building for Minority Entities have developed one such data-informed co-service framework for Native American or Alaska Native veteran VR consumers, and this approach might be considered in future co-service concepts.

Gender differences were also found on successful employment outcomes whereas females with disabilities were outpaced by their male counterparts during the crisis. This finding is consistent with previous studies (Kaya, 2018; Sung et al., 2015) reporting gender differences on successful employment outcome rates. For example, Kaya analyzed 3,320 case records in the FY 2013 RSA-911 database representing transition-age youth and reported that female VR consumers were significantly less likely to achieve successful employment when compared to their male counterparts. Plausible reasons for this finding include women with disabilities discrepancy in access to vocational education and work experience; increased likelihood of being married early with parenting responsibilities; and decreased likelihood of using social networks and mentors to find employment (Boeltzig et al., 2009). This analysis did not examine reasons for non-success based on gender, and thus previous findings cannot be corroborated or refuted. Nonetheless, there may be a need for practitioners to develop strategies that help female consumers successfully traverse vocational education access barriers and address the gaps in work experience to advance their employment competitiveness. Moreover, there may be a need for a new wrap-around service delivery model that considers "mothers with disabilities" parenting support needs. What supports might a young new mother with a disability need in order to gain competitive integrated employment? What direct service might be available, and what referrals might prove advantages to this mother? These are questions that might be worthy of exploration in an effort to increase positive employment outcomes among women with disabilities, especially those from multiply marginalized populations.

The finding that individuals with bachelor's degree or higher were more likely to achieve successful employment when compared to those with some post-secondary education, associate's degree/vocational technical certificate, or high school diploma or less was expected and confirms previous research. Moore and Wang (2016) used 11,603 case records from the FY 2013 RSA-911 database to analyze employment outcome rates for veteran VR consumers and found that those with a bachelor's degree or higher has higher probabilities for successfully returning to work than those with a high school diploma or less. A demand-side lens view dictates that those with needed skills and knowledge, which education provides, will be sought after to fill the voids across business and industry sectors. Differential educational attainment levels among multiply marginalized people of color with disabilities may warrant new service provision strategies that include identifying additional individuals who could benefit from vocational technical training and post-secondary college educational opportunities.

According to the 38th Institute on Rehabilitation Issues (IRI) Prime Study Group, culture is defined as "a system of language, values, and supports that extend and distinguish a group's sense of necessary identity" (IRI, 2015). In general, rehabilitation profes-

sionals should take culture into account in the pandemic across the entire service delivery process when supporting these consumers. While traditional cultural diversity training efforts espouse that providers are familiar with a finite knowledge about the cultural norms of every minority consumer, the IRI Prime Study Group encourages them to adopt the more pragmatic cultural humility approach. In this method the goal is not to master a finite body of knowledge about a specific group's cultural norms and values, but to simultaneously look inward to examine one's own conscious and unconscious biases, to reach outward to build relationships with individuals and communities, and to see the client as the expert (Hampton et al., 2017; McLennan et al., 2016; Tervalon & Murray-Garcia, 1998).

Conclusion

The aim of this study was to examine differences on employment outcome rates based upon consumers' race/ethnicity, gender, and level of educational attainment. The findings reflect that African Americans, Asian Americans and Native American or Alaska Natives were statistically significantly less likely to achieve successful employment compared to their reference counterparts. Success probabilities were 'poorest' for Native American or Alaska Native VR consumers followed by African Americans, Asian Americans, Latinx, non-Latinx Whites, and then Native Hawaiians/Pacific Islanders. African American and Native American or Alaska Native consumers were more often closed unsuccessful because they could not be located when compared to non-Latinx Whites. Finally, African American, Asian American, Latinx and Native Hawaiian/Pacific Islander employment outcome rates were found to be below the national benchmark across 7, 3, 6, and 5, respectively, of the 10 regions while such outcomes for non-Latinx Whites were below this criterion in only 3 of the 10 regions. Native Americans or Alaska Natives outcome rates were below the national benchmark across all 10 regions. These findings call for new service initiatives that target and advantage members of these communities of color as they pursue employment goals and aspirations.

Limitations

Three limitations exist in this study that may restrict the generalizability of the findings. First the data represent cases closed between January 20, 2020 (date of first reported COVID-19 infection in the U.S.) to June 30, 2020, which only represents a snapshot of outcomes in the pandemic. At the time, this RSA-911 database was the latest available information, and so there is a need to identify employment success factors when subsequent years of the data is accessible to researchers. One future research idea could be to use RSA-911 data to assess pre and post COVID-19 employment outcome differences across target racial and ethnic consumer populations. Moreover, within target group comparison whereby employment rates for African Americans before and during the crisis would be the focal point for analysis could be accomplished; and this could be done within each respective target group. Second, although minor mitigations might have been planned and/or implemented within some corridors around the first infection detection date, drastic measures within SVRA context and on the demand-side (i.e., business and industry) were not implemented until March 2020 or thereabout leaving half of the study period vul-

nerable to other proxies that may have contributed to the results. Since there was such ambiguity about a specific date the pandemic could have begun to impact employment among target population members, the first reported infection date was selected to provide a clear and fact-laden baseline for subsequent analysis. Future researchers might wish to mine the RSA-911 data to explore alternate impact dates to address similar research questions. Third, information contained in the RSA-911 database is not invulnerable to counselor errors, and thus it is uncertain whether all data is precise. The findings, however, may be helpful to SVRA leaders and others in their strategic efforts to address equity in employment among multiply marginalized persons of color with disabilities.

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