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PROGRAM EVALUATION

Supporting community health workers during the COVID-19 pandemic: A mixed methods pilot study

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Abstract

Objective: To examine how the COVID-19 Project ECHO program may have influenced the mental health of community health workers (CHWs) from South Texas. The program was designed around case-based learning and mentorship to provide support to CHWs and help them gain expertise to provide services to their communities.

Design: An explanatory sequential mixed methods pilot study.

Sample: Fifteen CHWs who were enrolled in the program participated in this study.

Measurements: The Center for Epidemiological Studies-Depression (CES-D) and the Perceived Stress Scale (PSS) were used to measure the differences pre- and post-intervention. Qualitative description was used to explore the experiences of the participating CHWs.

Results: The PSS post-test mean (12.53) showed a statistically significant decrease from the pretest mean (17.01) (t (14 = 2.456, p = .028). The CHWs explained that the death of loved ones, feelings of isolation, and work-related concerns influenced their mental health. CHWs expressed that the program provided them with emotional support and resources for their clients.

Conclusions: The impact of the COVID-19 pandemic on disadvantaged and medically underserved areas will be long-lasting; therefore, the need is greater than ever for CHWs to receive mental health support and be able to connect communities with vital resources.

KEYWORDS
community health workers, COVID-19, mental health, project ECHO

1 | INTRODUCTION

Public health crises, such as the novel coronavirus disease (COVID-19) pandemic, have led to significant community-wide disruptions in all sectors of public and private life including extreme changes and challenges in the delivery of healthcare services. Mounting evidence indicates that healthcare workers have suffered a deterioration in their mental health as a result of the pandemic, with studies reporting high prevalence rates of depression, anxiety, burnout, insomnia, and stress (Chew et al., 2020; Labrague, 2021; Shechter et al., 2020). The overwhelming workload coupled with the limited number of resources and staff available to mitigate the spread and reduce the mortality of COVID-19 is commonly faced by healthcare workers (Gupta & Sahoo, 2020; Pappa et al., 2020). Additionally, ongoing concerns about the spread of the COVID-19 virus to family members, feelings of isolation, losing loved ones from COVID-19 and exposure to the troubling news

in the media are believed to play a role in the development and exacerbation of mental illness among healthcare workers (Fuchs et al., 2020). As the cases of COVID-19 in Texas surpass seven million and deaths surge past one million, as of September 2022 (Texas Department of State Health Services, 2022), the justification for additional support for all healthcare workers, including community health workers (CHWs), is critical. Supporting their mental health is essential and is a crucial part of the public health response to the ongoing COVID-19 pandemic.

Recognizing the need to support CHWs, we developed and piloted a COVID-19 Project Extension for Community Healthcare Outcomes (ECHO). The Project ECHO model, which was developed at the University of New Mexico, uses a "hub" and "spoke" paradigm where content experts at an academic hub are connected with several spoke sites to disseminate knowledge (Project ECHO, 2022.). Didactic presentations and case-based learning are used to promote the sharing of knowledge and mentorship by content experts. The Project ECHO principle emphasizes, "all teach, all learn" (Project ECHO, 2022.) where all attendees are encouraged to share their thoughts and feedback. Findings from previously published studies indicate that Project ECHO was effective in providing support, relaying knowledge, and increasing confidence among healthcare providers (Bessell et al., 2022; Miele et al., 2020; Chaple et al., 2018). In their study of a Project ECHO program for CHWs, Zapata et al. (2021) found that the program created a learning community where CHWs were able to receive support and develop skills and knowledge concerning opioid use disorders while working with content experts in behavioral health.

Studies examining the mental health of CHWs are limited (Zapata et al., 2022). The increasing needs of the community are resulting in mental fatigue, burnout, and poor mental health in CHWs (Recto et al., 2022). There has been an emergence of Project ECHO programs that utilize CHWs' capacity to address health and social issues of underserved populations (Damian et al., 2020; Zapata et al., 2021). However, few studies have examined the impact of Project ECHO on the mental well-being of CHWs.

2 | BACKGROUND

2.1 | The role of CHWs in the community

The American Public Health Association (2021) defines a CHW as a "frontline public health worker who has a close understanding of the community served." CHWs are trusted members of the community who work in various healthcare systems such as clinics, mental health facilities, substance abuse programs, and nursing homes, as well as community-based organizations in both urban and rural environments (NIH, 2014). CHWs play a critical role in their communities as they help to address the social determinants of poor health that is magnified during a public health crisis among low-income, minority populations (Peretz et al., 2020). CHWs in South Texas help to connect clients to food pantries, unemployment resources, rent assistance, primary care, and mental health services, as well as address misinformation and fear by providing accurate information about COVID-19 (Peretz et al., 2020). With two-thirds of the residents and CHWs in Texas identifying as Latino/Hispanic (Health Professions Resource Center, 2019; United States Census, 2019), CHWs are able to provide culturally appropriate care that resonates with their communities, thus establishing strong working relationships with their clients.

2.2 | Description of the COVID-19 project ECHO program

Our team from the South Texas Area Health Education Center (ST-AHEC) consisting of CHWs, nurses, and public health specialists developed and piloted a COVID-19 Project ECHO Program to help support CHWs in their COVID-19 related work. The main topics that were covered include an overview of COVID-19 information, health disparities, mental health, and self-care.

The COVID-19 Project ECHO pilot program was conducted over 13 weeks from May through July of 2021. The "hub" consisted of our ST-AHEC program team and our CHW content expert, while the "spokes" included participating CHWs throughout South Texas. Each weekly, 2-h session included a brief didactic presentation on one of the main topics mentioned above and a participating CHW's presentation of a client case. The client case provided an opportunity for the participant to frame the issues and concerns their client was facing.

Following the didactic portion, a hub team member facilitated a discussion around the CHW's presented case, allowing everyone to participate. This approach benefited all participants such that the telementoring sessions allowed CHWs to gain support and leverage the information and expertise that was provided to them into actions that can improve the well-being of their clients.

2.3 | Study purpose

The explanatory sequential mixed methods pilot study we describe in this paper aimed to explore how the Project ECHO program may have influenced the mental health of CHWs as they learned to better care for their communities. The aims and associated research questions for this mixed methods study are as follows:

(Quantitative) Aim #1: To pilot a Project ECHO program to positively influence the mental health of CHWs.

RQ.1 Are there any differences in the CHWs' depressive symptoms and perceived stress before and after completing the COVID-19 Project ECHO?

(Qualitative) Aim # 2: To explore the experiences of CHWs who attended the program.

RQ. 2: How has the COVID-19 Project ECHO influenced the mental health of CHWs?

(Mixed-Methods) Aim # 3: To integrate the quantitative and qualitative findings to more comprehensively explore the outcomes of the participating CHWs' mental health.

RQ. 3: How do the qualitative data provide a nuanced understanding of the quantitative data?

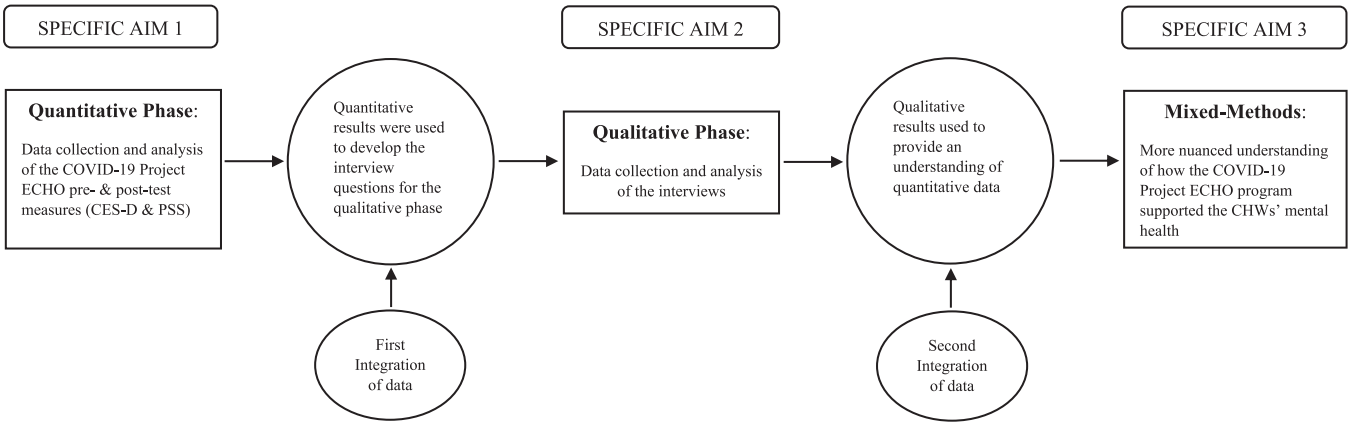

FIGURE 1 Explanatory sequential mixed methods design

3 | METHODS

3.1 | Design

This study is an explanatory sequential mixed method design (see Figure 1). The first phase was a longitudinal study that examined how the Project ECHO telementoring program may have impacted the mental health of CHWs. We collected quantitative data (pre- and post-test measures of depressive symptomatology and perceived stress) and analyzed the results. During the second phase, we conducted qualitative data collection. Qualitative description was used to explore the experiences of CHWs who attended the program. Integration occurred at two time points: the quantitative data were used to inform the qualitative phase, and the qualitative data were used to provide a nuanced understanding of the quantitative data (Creswell, 2015).

3.2 | Sample and participants

Approval from the university institutional review board was obtained before study initiation. This study was conducted through the ST-AHEC, which has a well-established CHW training program with the primary purpose of improving health in communities. The catchment area of the ST-AHEC includes 35 counties in South Texas, serviced by five regional AHECs. The region, particularly along the Texas-Mexico border, is characterized as a medically underserved area (MUA) that is predominantly Latino, with a large portion of the population living below the poverty level with little or no access to healthcare services. CHWs were recruited for the COVID-19 Project ECHO through the five regional AHEC centers. A total of 33 CHWs enrolled in the COVID-19 Project ECHO pilot. The inclusion criterion for this mixed methods pilot study was any CHW who was enrolled in the COVID-19 Project ECHO. During the orientation meeting for the COVID-19 Project ECHO, our team met with the CHWs to explain the details, purpose, and goals of the study. CHWs who expressed an interest to volunteer in the study were provided with a follow-up email and a link to complete the preprogram surveys. Of the 33 CHWs who participated in the COVID-19 Project ECHO program, a total of 15 CHWs participated in this mixed methods study.

3.3 | Data collection

The sociodemographic survey included questions about age, race/ethnicity, number of years employed as a CHW, and whether they were employed in an urban or rural area. The participants were also asked to complete the following questions: Have you tested positive for COVID-19? Have you ever experienced depression? Have you worked with clients who became ill with COVID-19? Have you lost a loved one due to the COVID-19 pandemic?

For the quantitative phase, the 15 CHWs were asked to complete the Center for Epidemiological Studies-Depression (CES-D) and the Perceived Stress Scale (PSS). The CES-D (Radloff, 1977) is a 20-item, 4-point Likert scale instrument that aims to identify depressive symptomatology. With a possible range of scores from 0 to 60, a cutoff score for the identification of depressive symptomatology is 16 or greater (Radloff, 1977). The CES-D has a good internal consistency that ranged from .85 to .91, and has been used successfully across wide age ranges and populations, including Latino populations (Roberts, 1980). The PSS is a 10-item, 4-point Likert scale questionnaire that measures the degree to which individuals appraise situations in their lives to be stressful (Cohen & Janicki-Deverts, 2012). Scores range from 0 to 40, with higher scores indicating greater perceived stress (Cohen & Janicki-Deverts, 2012). Internal consistency coefficients for PSS ranged from .74 to .91 (Cohen & Janicki-Deverts, 2012). Depressive symptoms and perceived stress were measured pre and post the COVID-19 Project ECHO program. A gift card in the amount of $30 was given after the completion of the pre- and post-surveys. After collecting and analyzing the quantitative data, our team met to discuss and interpret the findings to help develop the semi-structured interview questions (see Table 1). Eight CHWs participated in the individual

TABLE 1 Interview guide

Interview questions
• In what way has the COVID-19 pandemic impacted the mental health of CHWs? • The scores for the depressive symptoms were lower after the program than before. What do you think are some reasons for why this might be? • The scores for stress were lower after the program than before. What do you think are some of the reasons for why this might be? • In what way might the program be helpful to the participating CHWs' mental health? • What parts of the program did you find helpful for you?

interviews and a gift card in the amount of $40 was given for their participation.

3.4 | Data analysis

For the quantitative phase, we used the Statistical Package for the Social Sciences (SPSS) software to analyze the quantitative data. Descriptive statistics were used to examine socio-demographic characteristics of the CHWs. A paired sample *t*-test was used to examine group differences between pre- and post-test scores for the CES-D and PSS. For the qualitative phase, we used qualitative content analysis to analyze the data from the interviews (Schreier, 2010). The first author verified the accuracy of the transcripts and audio-recorded interviews prior to data analysis. The process began with a line-by-line coding of the transcripts using Microsoft Word. Segments of data were summarized and paraphrased whenever they represented relevance to the project. The first author compared the summaries and grouped them together based on similarities in phrases and patterns, and verified this with the second author. The process was finalized by assigning each group of summaries to a category. Within each category, data were clustered into subcategories whenever they represented a common idea. These were shared with the other authors to confirm the accuracy of the data analysis.

To address research bias, trustworthiness was achieved through criticality, credibility, and authenticity (Whittemore et al., 2001). Criticality, or an account of decision-making, was ensured through audit trails documenting each aspect of the analyses. Credibility, or the believability of the findings, was accomplished through the process by which the authors analyzed and reviewed the data for confirmation of the findings. Authenticity, or treating the participant's voice with utmost importance, was achieved through repeated data immersion.

After the quantitative and qualitative data were both analyzed, our team met and discussed both of the analyses. Creswell (2015) explains that the explanation of the data in an explanatory sequential mixed methods design occurs when qualitative data are used to explain the results of the quantitative data. Thus, we examined the differences of the pre- and post-test means of the CES-D and PSS and compared them to the participant's responses to better understand what may have influenced the differences in their scores.

TABLE 2 Sample sociodemographics and characteristics of CHW participants ($N = 15$)

Mean age, years ± (SD)	**51.5 (10.54)**	
Race/Ethnicity	*n* (%)	
Hispanic/Latino	13 (86.7)	
Non-Hispanic White	1 (6.7)	
African American	1 (6.7)	
Duration employed as a CHW		
<5 years	7 (46.7)	
≥5 years	8 (53.3)	
Mean duration of years serving as a CHW ± (SD)	5.37 (3.55)	
Employment environment		
Urban	11 (73.3)	
Rural	4 (26.7)	
Prequestionnaire items	Yes	No
Have you tested positive for COVID-19?	1 (6.0)	14 (94.0)
Have you worked with clients who became ill with COVID?	6 (40.0)	9 (60.0)
Have you lost a loved one due to the COVID-19 pandemic?	6 (40.0)	9 (60.0)
Have you ever experienced depression?	8 (53.3)	7 (46.7)

4 | RESULTS

4.1 | Quantitative data

All of the 15 CHWs were female, with a mean age of 51.5 years. Thirteen identified as Hispanic/Latina, one identified as African-American, and another as non-Hispanic, White. Eleven CHWs were employed in an urban setting and have served as a CHW for a mean of 5.37 years. Six CHWs indicated working with clients who became ill with COVID-19. Additionally, six CHWs lost loved ones due to COVID-19 and one indicated having tested positive for COVID-19. Eight CHWs indicated having experienced depression in the past (see Table 2).

All of the participants completed both the pre-test and post-test surveys, which were delivered via REDCap. A paired sample *t*-test was calculated to compare differences in pre-test and post-test means of the CES-D and PSS. The CES-D post-test mean score was lower than the pre-test mean score (pre-test mean = 16.20, post-test mean = 10.67). Though the findings were not statistically significant, they appear to be clinically significant in that the means decreased from above the cutoff score, (16 and above)

TABLE 3 *T*-test findings of changes from pre- to post-test means of the CES-D and PSS survey ($N = 15$)

	Pre-test	Post-test	*t*-value	*P*-value*
PSS scores				
Mean score ± (SD)	17.01 (7.21)	12.53 (6.56)	2.456	.028
Range	0–28	3–23		
N with low stress	7	9		
N with moderate stress	6	6		
N with high stress	2	0		
CES-D Scores				
Mean score ± (SD)	16.20** (11.40)	10.67 (8.15)	1.921	.075
Range	4–39	0–24		

*Two-sided *P*-value.
**≥16 indicates depressive symptomatology.

TABLE 4 Qualitative findings: categories, subcategories, and exemplar quotes

Categories	Subcategories	Exemplar quotes
Challenges during the COVID-19 pandemic	Ongoing fears about the COVID-19 virus Continuing to serve their communities Death of loved ones and feelings of isolation Multiple responsibilities	"It was within a month or so because there was no—is it gonna go away? No. Is it gonna get worse? Is it gonna get better? We don't know." "I think that some of the things that they're going through, definitely high levels of stress, high levels of frustration, anxiety about working out in the field when we have to, and being in contact with people that you don't know." "Then I lost a lot of people as well, neighbors and family members and friends and friends' families. It was really, really stressful… There's the lack of the normal support system that you would have because you can't grieve with family." "The stress itself, being a mother and being a wife, having my kids home, virtual learning. I do have a daughter that has some kind of special needs. That in itself was already stressful."
Coping strategies	Staying connected Praying and leaning on their faith Staying productive	"Staying connected with people. It makes you stay in reality. If you isolated and you're not connecting with people, you lose track of time, you're not motivated." "I believe that having the faith or the belief the size of a mustard seed… Having that little tiny bit of faith, hanging onto that is what keeps me moving forward." "It was hard but that's what I just realized that I need to keep my mind busy. That's why I take a lot of webinars and take notes so I can review and read them."
Reactions to the program	Togetherness Learning through shared experiences Gaining knowledge	"I think it is therapeutic for other CHWS. Again, just coming in and just being with people being part of the group, and talking, and even sometimes just listening." "I just thought it was interesting that you have a group of people that are from different walks and different experiences that you're able to learn from and you're able to share." "I feel like it was helpful cause we don't have to go by hearsay… Getting the correct information so you can provide the right information to anyone who may be in need of resources."

indicating depressive symptomatology, to below the cutoff score. The PSS post-test mean (12.53) showed a statistically significant decrease from the pre-test mean (17.01) (t (14 = 2.456, $p = .028$) (see Table 3).

4.2 | Qualitative data

The main categories representing the participant's responses are as follows: (1) challenges during the COVID-19 pandemic, (2) coping strategies, and (3) reactions to the program. These categories along with the aligned subcategories are described below. See also Table 4 for a list of the categories, subcategories, and exemplar quotes.

4.2.1 | Challenges during the COVID-19 pandemic

The CHWs detailed various examples of work-related and personal stressors. Their concerns pertained to ongoing fears about the COVID-19 virus, maintaining safety guidelines while working, and managing multiple responsibilities. Some of the CHWs explained that the death

of their loved ones and feelings of isolation negatively impacted their mental health.

Ongoing fears about the COVID-19 virus

During the initial outbreak, many of the CHWs expressed their fears about COVID-19 as news surfaced about its pervasiveness and the high risk of mortality for individuals who were infected with the virus. Participants were struck with disbelief at the widespread impact of COVID-19 as they witnessed those who were close to them become ill with the virus, "You're in disbelief and denial… When you start seeing your coworkers get sick, that's when it started to become real for me." They explained that many CHWs quit their jobs due to fears of contracting the virus and spreading it to their family members. With fewer staff and volunteers available to assist their communities, some CHWs felt overwhelmed by the immense workload. Additionally, many feared being laid off from work and losing their jobs, "I didn't know if I was gonna have a job… Do I need to change jobs or another career? Our volunteers dropped… the capacity went downhill."

Safety concerns while working in the community

As the infection rates and the number of deaths from COVID-19 continued to rise in their areas, safety became a top priority. The CHWs were vigilant to don protective personal equipment whenever they worked in person. Many CHWs continued to work in their communities, however, they were constantly concerned about the level of risk they were taking as some of the participants felt that safety protocols were not always being enforced in their communities. Throughout the interviews, this was reported as the main source of stress for CHWs when working in the community. "We'd walk into a situation and even if you think you know what you're gonna expect, it's never what you expect. That's stressful not knowing what you're going to walk into." CHWs also conveyed their frustrations whenever some community members disregarded the safety guidelines. One CHW was deeply upset by this, explaining that she lost several family members to COVID-19:

> Seriously, it's just a mask. I lost people early on… We've already lapped the anniversary of their deaths… How can you possibly not elevate saving somebody's life or potentially not infecting other people? If somebody feels oppressed by having to wear a mask, that's a pretty privileged life.

Multiple responsibilities

In addition to their heavy workload, the CHWs described the multiple responsibilities they were managing and the stress they experienced from being unable to keep up with its demands. For example, one participant was the primary breadwinner of her family, as well as a single parent supporting her children and grandchildren. The stress of caring and providing for her family, the demands at work, and the constant worry of being laid off from work took a toll on her as she described feeling depressed, "It could take a mental toll and lead to depression. You shut down completely. You're drained. You don't have no more to give. You don't wanna be bothered 'cause you feel like they want something from you."

Death of loved ones and feelings of isolation

Several of the CHWs were candid about their experiences of losing loved ones due to complications from COVID-19. Some of the participants conveyed this as the reason for their elevated scores on the CES-D and PSS. Unable to grieve with family members because of social distancing measures, the pain from the death of their loved ones, and feelings of isolation made it difficult for some CHWs to heal. One CHW tearfully explained the need to separate her personal life from her work in order to move forward and stay productive, "It's really difficult but you just have to dissociate yourself at the time from what you're doing. It's a lot of compartmentalization because otherwise, even right now, I'm in tears all the time from some of it still." Not only has the COVID-19 pandemic dramatically changed the lives of the CHWs, but it also has impacted the way they grieved. More than 1 year after the death of several of her relatives one CHW explained:

> I'm not really sure what grieving looks like… I'm not sure 'cause usually you've got all of your stages of grieving, and the anger and everything, and I'm not necessarily seeing that. I guess one of the ways that I cope with it is more isolation which is not good for me.

For some CHWs, it was difficult to provide emotional support to others and find comfort from loved ones when they also were dealing with their own personal issues. This was the case for one of the participants and her significant other, "I don't feel like he is a strong support for me because he's got his own pile of crap that he's dealing with as well. I try to be a support for him. How effective I am, that I don't know."

4.2.2 | Coping strategies

The CHWs undoubtedly faced multiple challenges during the pandemic. To help them cope with the various stressors mentioned above, they described staying connected, praying, and being productive.

Staying connected

The participants mentioned the importance of staying connected with loved ones such as family members, friends, and colleagues. Many of the CHWs who worked tirelessly in their communities turned to their colleagues for support and encouragement since many of them were able to relate to one another. "The one thing that I needed and I still need is having that support system from other CHWs knowing that you can relate… We were our support system. We shared about things and how we can make things better."

Praying and leaning on their faith

Some CHWs mentioned prayer as a way to help them stay grounded while experiencing so much uncertainty during the pandemic:

> When we are living in an uncertain time in a world where we got leaders who don't know what to do, where do you go from there other than pray to keep you grounded? You have to believe in some higher power than you to make it. Otherwise, we're lost souls.

While many of these CHWs continued to face difficult circumstances, they leaned on their faith for hope, "I know it can be impactful but it's staying in the right mindset that if you believe in your faith, this too shall pass. Just hanging on the word of God is what I do to stay positive."

Staying productive

CHWs also explained the importance of staying productive during the pandemic. Many of the participants enrolled in online workshops and classes to gain knowledge in order to better assist their clients and to also stay positive, "I feel like the advantage to learn more. Most people probably go drinking or do something self-destructive. I have the internet on, take advantage of these resources. I just kept busy doing something positive and staying busy." Recognizing the pandemic's negative impact on mental health, one CHW saw advocacy as a way of staying active in her community and helping individuals who are living with mental illness, "There is a website where you can subscribe to the legislator so you can find out when there's a mental health bill being passed. You can fight and advocate. You can speak on behalf of people who have disabilities."

4.2.3 | Reactions to the program

The CHWs explained that the program provided support such that it fostered a sense of togetherness and allowed them to share their personal experiences. Additionally, the didactic portion helped them gain knowledge about COVID-19-related information and resources.

Togetherness

The majority of the participants explained that the program fostered a sense of togetherness through the camaraderie that was formed amongst the CHWs. The reassurance, validation, and nonjudgmental attitudes, which the CHWs welcomed, were found through each other during their interactions. One CHW explained that the program enabled her to voice her concerns and obtain support from her peers:

> I'm gonna tell you, the thing that stands out to me the most—because it really impacted me—it's staying connected with the people. You don't have no connection with people and talking out your feelings and what's happening in the world and finding resources to help you through this whole pandemic situation … I love that there was no judgement. That's a big plus, because you get to share you.

Learning through shared experiences

Some CHWs saw the program as a way to share their knowledge by providing personal experiences, "You want to utilize your skills and talent and testimony with other people. I feel like whatever knowledge that you have, why not share it? Tomorrow is not promised to us." They also appreciated the recommendation feedback that was part of the program as one CHW explained, "I would say the recommendation feedback…You might think you know it all, but you don't. Hearing the reality of someone else's life and getting recommendations, it should make you a better person in how you address and deal with things."

Gaining knowledge

Finally, the didactic sessions were helpful in arming the CHWs with additional knowledge so they can better assist their clients. The information provided during the didactic portion of the program also eased the CHWs' trepidations given the rapidly changing information that was surfacing from various media sources. This was especially important to the participants that felt it was critical to delivering factual, up-to-date, and relevant information to their clients:

> I think it strongly helped… This is a well-informed group where y'all are getting facts and we know it's not, "Oh, my abuelita heard—" or "Oh, my uncle said from down the road—" No. it's actual facts that we're being informed properly so we are more at ease.

4.3 | Integration of data

The qualitative interviews served to provide a deeper understanding of what may have influenced the differences in the pre- and post-test CES-D and PSS means (see Table 5). The stressors mentioned by the CHWs were multifactorial and stemmed from uncertainty about the COVID-19 virus, job insecurity, safety concerns while working in their communities, fear of contracting the virus and spreading it to family members, and managing multiple responsibilities at home. Additionally, some of the CHWs indicated experiencing depressive symptoms due to the death of loved ones from COVID-19 and feelings of isolation. As a coping strategy, CHWs relied on their support system for comfort through the difficult circumstances they were experiencing. Prayer allowed the CHWs to manage their stress and feelings of uncertainty during the pandemic. Of note, sharing their personal experiences with each other, receiving feedback from their peers, as well as obtaining up-to-date information about COVID-19 during the Project ECHO sessions provided encouragement and reassurance. It also helped these CHWs to better assist their clients by equipping them with tools they can use to address the concerns of their communities.

5 | DISCUSSION

The purpose of this explanatory sequential mixed methods pilot study was to examine how the COVID-19 Project ECHO program may have

TABLE 5 Integration of the quantitative and qualitative data

Quantitative results	Qualitative findings	How the qualitative findings helped to explain the quantitative results
PSS mean scores Pre-test: 17.01 Post-test: 12.53 **CES-D mean scores** Pre-test: 16.20 Post-test: 10.67	**Challenges during the COVID-19 pandemic**: Ongoing fears about the COVID-19 virus: uncertainty about the virus, fear of losing their jobs, and contracting the virus and spreading it to their family. Safety concerns while working in the community: frustrations over some community members who disregarded safety guidelines. Multiple responsibilities: stress from caring for their families and the demands of work. Death of loved ones and feelings of isolation: unable to grieve for loved ones who died from the coronavirus due to social distancing measures; having inadequate support. **Coping strategies**: Staying connected: obtaining support from family members and colleagues. Praying: Reliance on their faith and prayer for hope. Staying productive: Taking online workshops and classes and advocating for vulnerable populations. **Reactions to the program**: Togetherness: The program provided camaraderie, reassurance, validation, and support for the participating CHWs. Shared experiences: sharing first-hand experiences with other CHWs. Gaining knowledge: obtaining factual about COVID-19 and relevant resources and services for their clients.	The stressors were multifactorial and pertained to uncertainty about the virus, job insecurity, safety concerns while working in the community, fear of contracting the virus and spreading it to family members, and managing multiple responsibilities at home. Depressive symptoms were due to grieving the death of loved ones from COVID-19 and from feelings of isolation. Some CHWs relied on their loved ones for comfort and prayer to manage their stress and feelings of uncertainty during the pandemic. Staying productive through webinars and online classes was helpful because it provided CHWs with information related to COVID-19 and resources they can use to help their clients. The COVID-19 Project ECHO provided much-needed emotional support and reassurance to CHWs. It also provided information about COVID-19 and relevant resources that can be used to help communities.

influenced the mental health of CHWs from rural and urban MUAs in South Texas. Fifteen CHWs completed the pre- and post-surveys, and eight CHWs were interviewed for the qualitative portion. The pre-test means for both the CES-D and PSS were higher than the post-test means. Though the change from the pre- and post-test CES-D mean was not statistically significant, the pre-test mean was above the cut-off score of 16, indicating the presence of depressive symptomatology prior to the beginning of the program, and the post-test mean, well below the cutoff score of 16. Additionally, the PSS pretest mean was significantly higher than the post-test mean. Previous studies reported that feelings of uncertainty and isolation related to the pandemic, fear of exposing themselves and their families to COVID-19, and safety concerns over one's work environment contributed to poor mental health outcomes in healthcare workers (Gupta & Sahoo, 2020; Muller et al., 2020). Similarly, our participants mentioned that uncertainty about the virus, safety concerns while working in the community, fear of contracting the virus and spreading it to family members, grieving the death of their loved ones from COVID-19, and feelings of isolation as some of the reasons for why they experienced stress and depressive symptoms.

The participants detailed the multiple challenges they encountered during the pandemic and how these challenges influenced their mental health. As healthcare workers continue working through these difficult times, there are limits to the amount of stress they are able to endure (NAS, 2019). It has been proposed that when stress overpowers resilience, the well-being of healthcare workers may begin to deteriorate and also their ability to provide assistance to their clients (NAS, 2019). This underscores the importance of supporting the mental health of CHWs as it will contribute to better efficiency of their work and ensure that CHWs are better able to serve their communities during the pandemic.

In regards to coping strategies, a systematic review reported that frontline emergency healthcare workers identified social support, prayer, and staying productive as ways to combat the mental and psychological burden of the COVID-19 pandemic (Labrague, 2021). Our participants also identified these strategies as a way to cope with the challenges they were facing.

The COVID-19 Project ECHO not only provided a place where information could be shared, it also created a nurturing place where CHWs were able to build relationships, convey support and reassurance, and relate to one another. During the pandemic, when stress levels may be elevated, support from peers may help healthcare workers maintain healthy emotional states (Muller et al., 2020). Our participants mentioned that they often relied on their colleagues as sources of support because they understood the struggles that CHWs were facing.

Despite the disruptions and threats caused by the COVID-19 pandemic, the CHWs continued to assist their communities to ensure that their health needs were met. Studies that examined the influence of coping strategies on the mental health of healthcare workers suggest that increasing coping skills and providing social support may help to protect healthcare workers against the adverse psychological consequences of the COVID-19 pandemic (Labrague, 2021; Suresh

et al., 2021). As a workforce, CHWs are indispensable to our communities especially during times of crisis as they provide an array of services to their clients. Therefore, investing in their mental health is critical to ensure that they are able to endure the demands of their duties and maintain a work-life balance during the ongoing pandemic.

This mixed methods pilot study allowed us to examine how Project ECHO may be utilized to help support the mental health of CHWs as they learned to better care for their communities. As stated, Project ECHO (2022) emphasizes a principle of "all teach, all learn." This was evident during the case presentations as participating CHWs provided insight and offered their perspective based upon their experiences. The testimonies and firsthand experiences of the participants allowed for meaningful interactions within the group that resulted in a program that spoke to the needs of the CHWs. Additionally, the participants explained that the program enabled them to acquire knowledge to better assist their clients and much-needed emotional support.

There are some limitations to the study presented above. Only 15 of the 33 CHWs who attended the COVID-19 Project ECHO program participated in this mixed methods study. Thus, our results may have differed if all of the CHWs had chosen to participate in this study. As mentioned by the participants, CHWs were facing multiple stressors amidst the pandemic such as increased workloads, understaffed personnel, and balancing multiple responsibilities. These may be reasons why the other CHWs in the program opted not to participate in this study. Though our study had a small sample size, it allowed us to understand how a Project ECHO program might have influenced the mental health of CHWs as they obtained skills and knowledge related to COVID-19. The participants were CHWs from rural and urban areas in South Texas therefore, findings may differ for CHWs residing in other areas.

The impact of the COVID-19 pandemic on disadvantaged and MUAs will be long-lasting; therefore, the need is greater than ever for CHWs to receive mental health support and be able to connect communities with vital resources. Our participants indicated that Project ECHO was helpful since it fostered an environment that allowed them to make connections, and build relationships while acquiring knowledge about COVID-19.

AUTHOR CONTRIBUTIONS

All authors have contributed to the preparation of the manuscript, have read, and approved the submitted manuscript. All authors listed meet the authorship criteria according to the latest guidelines of the International Committee of Medical Journal Editors and are in agreement with the manuscript.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICAL APPROVAL

All relevant ethical safeguards have been met in relation to patient or subject protection, or animal experimentation, including, in the case of all clinical and experimental studies review by an appropriate ethical review committee and written informed patient consent. The research complies with the World Medical Association. The work is original and not under consideration by any other journal.

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