Barriers to Implementation of a Technology-Based Mental Health Intervention in a Rural Setting

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Abstract. This study utilized qualitative focus groups with rural health providers and patients to explore barriers to implementation of a technology-based mental health intervention for the treatment of depression in a primary care setting. A randomized controlled trial (RCT) was implemented in both urban and rural primary care practices to test the feasibility and effectiveness of computerized cognitive behavioral therapy (CCBT) for depression. Early implementation identified lower rates of willingness to participate in the intervention by rural patients. Subsequently, focus groups were conducted with rural providers and patients to explore barriers to participation and strategies to overcome these barriers in future implementation efforts. Two focus groups of five to seven participants each were conducted to understand patient experiences. Groups lasted approximately one hour and were recorded and transcribed for coding purposes. Key themes identified about barriers to use of CCBT by rural patients emerged included: 1) technical barriers, 2) stigma, 3) distrust of outsiders, 4) effort/motivational barriers, and 5) staff resistance/frustration. Conversely, several positive themes related to supports for CCBT also emerged, including: 1) readiness to change/symptom severity, 2) program supports and incentives, 3) clinician support, 4) components of the intervention, and 5) individual patient characteristics.

   Keywords: rural social work, rural social work practice, rural collaborative practice, depression, technology, mental health, primary care

Approximately 17.3 million adults in the U.S. experience a major depressive episode each year, representing 7.1% of the adult population (National Survey on Drug Use and Health [NSDUH], 2018). Some studies suggest that the rate of depression may be higher among rural populations (Breslau et al., 2014; Weaver et al., 2014; Probst et al., 2006; Wang et al., 2004). Suicide rates also are higher among rural residents compared to urban residents while rural residents are less likely to receive mental health treatment (Blüml et al., 2017). Higher rates of

suicide within rural areas are linked to greater access to firearms, fewer available health care providers, and higher rates of drug and alcohol use (Arbore, 2019; Brown et. al., 2014). Moreover, suicidality in rural areas is linked to older ages of residents as well as poorer general health, higher rates of poverty, and the 'lethal triad' of easy access to firearms, high rates of drug and alcohol use and isolation from younger family members (Arbore, 2019). When rural residents receive mental health services, they are often less effective as the result of limited access to quality mental health clinicians (Snell-Rood & Carpenter-Song, 2018; Arbore, 2019; Keefe & Curtain, 2012).

Barriers to Mental Health Service Utilization in Rural Areas

System Specific Barriers

Barriers to mental health service utilization in rural areas include accessibility, availability, consumer social acceptability, affordability, adequacy of services, and public awareness (Saurman, 2015). There has been documentation of a general lack of adequate mental health services to meet the needs of rural populations (Freeman et al., 2015; Petterson et al., 2009). Areas with higher percentages of rural, African American, and uninsured individuals are less likely to have Medicaid-funded treatment facilities (Cummings et al., 2014). However, even when services are available, lack of awareness of those services and the goals/objectives of mental health clinics negatively affect utilization (Saurman, 2015).

 Another problematic factor is distance from mental health clinics or collaborative care facilities, which also has been shown to be associated with depression among rural residents, particularly when distances were more than 40 kilometers (approximately 25 miles) (Wong et al., 2019). When services are available or accessible, a lack of privacy is another barrier that prevents rural residents from seeking services (Murry et al., 2011). Many rural residents are reluctant to go to mental health facilities because they worry that other community members will recognize their cars or presence at a clinic.

Lastly, there are barriers related to the quality of mental health services in rural areas. Research has shown that rural providers are often not trained in evidence-based practices, suggesting that rural patients may not receive the most effective treatments for mental health concerns when they do seek treatment (Dotson et al., 2014).

Population Specific Barriers

In addition to these service system barriers, there are population specific barriers to treatment for rural populations, with the most salient being stigma (Barley et al., 2011; Coventry et al., 2011; Henke et al., 2008; Regier et al., 1993; Stewart, 2018). For patients, stigma creates a barrier for help seeking, as well as acknowledging that there is mental health problem (Vallury et al., 2015). The rural cultural norm of self-reliance in addition to a high degree of interconnectedness among residents often precludes treatment initiation (Brown et al., 2014). Snell-Rood and colleagues (2017) report that the combination of stigma and rural stereotypes about self-reliance may prohibit help-seeking. Rural or Appalachian cultural norms also include a taboo against negative thinking (Snell-Rood et al., 2017).

Another population specific barrier is poverty. Many individuals in rural settings live in poverty, and poverty prevents people from being able to afford the cost of mental health care or transportation to care (Fox et al., 2001). Research has shown that providers identify uninsurance and under-insurance as primary obstacles for rural patients (Johansson et al., 2019; Arbore, 2019). Without adequate insurance coverage for mental health services, many lack the financial resources to pay for these services out of pocket. Further, millions of rural residents lack independent transportation (cars) to attend appointments and public transportation is likely not an option (United States Department of Agriculture, 2005).

Lastly, cultural competency to work with the characteristics of rural populations has been identified as a barrier to mental health care in this setting (Murry et al., 2011; Gone & Trimble, 2012). Specifically, providers must be familiar with the unique needs of farmers and ranchers, military personnel, tribes, and other ethnic minority groups to be prepared for rural practice.

Telehealth and the use of other forms of technology have been identified as strategies to overcome barriers to access and quality of mental health care for rural patients (Benavides-Vaello et al., 2013) such as accessibility, affordability, provision of evidence-based practices by providers, and privacy. Studies have found that clients with mental health issues are generally willing to use computer and or mobile technology to receive treatment (Brunette et al., 2019).

CCBT as an Effective Technology-Based Treatment

One type of technology-based mental health treatment, computerized cognitive behavioral therapy, has been identified as an effective practice for various settings and populations. A number of meta-analyses have documented the effectiveness and acceptability of CCBT, compared to waitlist controls, information control, treatment as usual, or placebo (Andrews et al., 2018; Thase et al., 2018; Wright et al., 2018; So et al., 2013; Wilks et al., 2016; Richards & Richardson, 2012; Andrews et al., 2010), with changes sustained six weeks to six months post intervention (Lobner et al., 2018). CCBT is also effective in reducing depression or anxiety using the various technology platforms, including the internet on computers, mobile phones or hand-held devices (Ebert et al., 2015**;** Bennet et al., 2020; Grist et al., 2019; Karyotaki et al., 2018; Howells et al., 2016; Cooney et al., 2018; Baffour, 2017). An important caveat is that clinical support appears to be crucial to achieving positive outcomes with CCBT. In a meta-analysis of 40 studies of CCBT for depression, Wright and colleagues (2019) found that clinician-supported CCBT had significantly larger effects ($g = 0.67$) than unsupported CCBT ($g = 0.24$).

Given the many aforementioned barriers to mental health treatment in rural areas, many individuals struggling with depression seek medication assistance in the primary care setting. Proudfoot et al. (2004) studied primary care patients in the United Kingdom with depression or anxiety who used a computer program plus treatment as usual (TAU) or TAU alone and found depression scores were significantly better after treatment in those who received CCBT. In two other studies in primary care (Høifødt et al., 2013; Mohr et al., 2013), depression rating scale scores improved more with CCBT than with a wait list. However, the provision of CCBT in primary care without clinical assistance (De Graaf et al., 2009) or with modest amounts of clinician support (Kivi et al., 2014) reported that depression rating scale scores were not

significantly better for CCBT than TAU. The largest study of CCBT in primary care (Gilbody et al., 2008) which offered only a small amount of technical support and no clinician support found no advantage for CCBT over treatment as usual. Two meta-analyses (Wells et al., 2018; Wright et al., 2019) have reported that CCBT is less effective in primary care settings than other populations.

CCBT in Rural Areas

In a systematic review of CCBT in rural areas, Vallury and colleagues (2015) found that CCBT is equally efficacious for rural and urban patients in the treatment of depression and even more acceptable to rural patients because it addresses their confidentiality concerns and disinterest in face-to-face contact. Other studies on CCBT in rural settings with older adults found significant decreases in symptoms of depression (Shah et al., 2019) and anxiety (Hayward et al., 2007). The latter found that rural residents found CCBT acceptable and useful, impacts had large effect sizes, and that improvements were maintained over time. Collaborative care clinics in rural areas that include both physical and mental health have reduced depressive symptoms using CCBT programs or applications (Wong et al., 2019). Similarly, older adults receiving home health care successfully completed CCBT and experienced reduction in both depression and anxiety symptoms (Xiang et al., 2020). CCBT coupled with the assistance of a social worker or mental health clinician performing periodic check-ins has been well received by rural residents who are considered more utilitarian (Keefe & Curtain, 2012). Consistent with this study showing the positive impact of clinical support for CCBT in rural settings and the above literature on the importance of clinical support for effectiveness, Vigerland and colleagues (2014) found that there are no differences between urban and rural patients in openness to CCBT but the lack of human support would be a barrier. On the contrary, a study on the CCBT program MindWise with older adults in primary care facilities in rural areas found reductions in anxiety but not in depression, although the high dropout rate may have altered the findings (Collins et al., 2017).

Barriers to Use of Technology for Mental Health in Rural Settings

Despite the opportunity for technology to overcome barriers to mental health care in rural settings and the effectiveness and acceptability of CCBT specifically for rural patients, there remain challenges for use of this approach. These barriers are the primary focus of this qualitative study on rural implementation issues. Previous research has identified potential barriers to use of technology for mental health includes parity/reimbursement issues in telehealth, technology limitations, and the demographics of many rural populations.

One challenge identified is the lack of insurance coverage for telehealth services (Medicare Payment Advisory Commission, 2012) and difficulties for therapists with getting reimbursed (Health Resources Services Administration, 2013). A second major challenge for use of mental health technology in rural settings is lack of adequate internet infrastructure to support the interventions (Federal Communication Commission, 2016). By 2015, 78% of rural households had internet access but 39% of rural residences to not have access to advanced broadband internet. The digital divide between urban and rural areas is the result of geographic inequalities in connectivity resulting in decreased investment and poor local policy planning

(Salemink et al., 2017). Newer polices such as the federal Telecommunications Act of 1996 and the 2005 Rural Renaissance Act promised to improve rural connectivity, while in the latter case the program failed and in the former case the bill never passed (Salemink et al., 2017; Stewart, 2018). The COVID-19 pandemic has led to new developments in this arena, with the granting of waivers for telehealth and the prospect for these waivers to lead to long-term change in insurance coverage for telehealth. Lastly, characteristics of rural residents may also serve as a barrier to use of mental health technology, such as older age (O'Connor et al., 2018). The rural population has a large percentage of older residents, and older age may make individuals less comfortable with use of technology.

Current Study

This paper utilizes a qualitative approach to explore barriers to and facilitators of dissemination for the previously established efficacious CCBT intervention in rural primary healthcare settings. This qualitative study was part of a larger dissemination grant funded by National Institute of Mental Health, Agency for Healthcare Research and Quality (##R18HS024047) to explore the transfer of the CCBT intervention from one setting/patient population (outpatient mental health, variable income, urban) to another (primary care setting, lower income, urban and rural). As part of this five-year RCT, patients in a rural primary care clinic with significant levels of depression (defined by Patient Health Questionnaire [PHQ-9] [Kroenke et al., 2001] scores of 10 or above) were assigned to one of two conditions: 1) CCBT with telephonic and/or e-mail support + treatment as usual (TAU), or 2) TAU alone. Each person assigned to the CCBT group received a weekly phone call or email for clinical support (total of 20 minutes) per the recommendations of previous research to enhance efficacy. Patients who did not have a computer or internet access of their own were offered a loaner laptop and portable hotspot for program participation. They were also offered a training/orientation on the technology if needed. Over the five years of the study, approximately 24 rural patients were enrolled in the study out of 314 who were invited to participate (approximately 8%). Overall, of these 314 rural patients invited to participate, 43% declined to participate and the remainder were excluded/screened out or no showed/canceled, leading to the need for this study on barriers to and facilitators of participation in CCBT for this population. The primary research questions were the following:

1. What are the barriers to use of CCBT by rural patients? What are individual and intervention specific barriers?

2. What are the facilitators or supports of use of CCBT by rural patients? How can providers use these supports to better engage patients in the intervention?

Method

Study Design

This qualitative study utilized an interpretive approach to understand the experiences of rural providers trying to enroll patients with depression in CCBT.

Sample

Two separate rural focus groups were conducted with ten participants in the first group and eight participants in the second group for a total sample size of 18 participants. Participants included physicians, nurses, and other medical staff in a rural primary care clinic in a southeastern state. The providers all specialized in primary care or general practice, but they received in-depth training on both depression and CCBT so that they could support implementation of the study at their site. Demographics of the participants were as follows: average age was 47.03 ($SD = 13.15$, range 18-87), ethnicity was 56.6% Caucasian and 43.3% other, gender was 15.4% male, 84% female, and 1% non-binary or transgender female.

Focus Group Interview Guide

The following questions were asked to explore barriers to and facilitators of implementation of CCBT in the rural setting:

1. Briefly, what is your experience with implementation of evidence-based practices or other practice innovations in this treatment setting?

    a. Specifically, what have been some of the efforts to address the behavioral health needs of patients? Particularly depression?

    b. What has been your previous exposure to CBT or CCBT?

2. In the past, when this organization has implemented innovations for practice, what have been the supports that have enhanced this implementation? What have been the barriers to implementation? At the organization, management/leadership, team, and individual levels?

3. What is the team perception of inter-departmental or inter-disciplinary collaboration on initiatives such as these?

Procedure

Focus groups were conducted in person at the rural primary care clinic. Two facilitators asked providers the questions described above and took written notes. The groups were also recorded and transcribed for accuracy of analysis. The written notes/observations by the research team served as part of the audit trail for this work. Other elements of the audit trail included memos made during the analysis process and modifications made to the interview guide between the first and second group. The facilitators presented results of the groups to the overall project team for a peer debriefing process; this discussion led to the facilitation of the second group and modifications to the implementation strategies to support higher rates of participation. There was also informal member checking with participants by research staff during the enrollment process, as research staff addressed barriers directly with patients in an effort to maximize involvement.

Analysis

Using an applied thematic approach (Guest et al., 2012), informed by the constant comparative method of qualitative analysis (Boeije, 2002), qualitative data was analyzed with the line-by-line coding approach for content analysis where each segment of meaningful text was coded. Codes were grouped together to identify themes with unique cases and illustrative quotes for each theme. Data were coded by a single analyst but confirmed through peer debriefing and member checking. Themes in the data were discussed and finalized in consensus building discussions with the full study team, including topic and method experts, and through feedback from the medical providers.

<div align="center">

Results

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Several themes around barriers to use of CCBT by rural patients emerged including: 1) technical barriers, 2) stigma, 3) distrust of outsiders, 4) effort/motivational barriers, and 5) staff resistance/frustration. Conversely, several positive themes related to supports for CCBT also emerged, including: 1) readiness to change/symptom severity, 2) program supports and incentives, 3) clinician support, 4) components of the intervention, and 5) individual patient characteristics. The following summarizes the findings and illustrative quotes for each theme identified from the groups.

Barrier Themes

Technological Barriers

Staff concerns about the absence of efficacious computerized cognitive behavioral treatment often centered around the clients not having a personal computer. Clinicians believed that this lack of resources was due to rural residents' socio-economic constraints, which prohibited patients from being able to purchase personal computers or pay for regular internet services. They reported the clients would ask many questions and immediately say "no" despite the grant offering to provide a laptop and portable hotspot for internet access. One participant stated, *"The biggest problem with the whole project is because of the computer component."* Staff confirmed that patients are reluctant to use the internet for other functions, such as the patient portal for the primary care clinic. They stated, *"Patients do not get online to access their information."* Staff also believed that older patients were less likely to use smart phones or computers due to discomfort and lack of familiarity with the technology, which may have also been a barrier to their willingness to access the loaned computer and hotspot.

Stigma Barriers

Some staff believed that patients generally resisted the idea of therapy. One participant stated *"...the perception of others and the idea of having to go to therapy.....clients not wanting to be stigmatized by depression. It's more something you don't talk about due to stigmatization."* Similarly, providers reported that patients verbalized their personal fears of social stigma if seen entering a local mental health agency, supporting the idea that stigma continued to play a role as a barrier to treatment even though the treatment was on-line and in their own homes.

Distrust of Outsiders

Moreover, staff indicated that patients were unwilling to utilize medical providers in general, particularly if such individuals were considered outsiders. This may have applied to the CCBT program because there was a team member on site who was not a member of the community or regular staff person at the primary care clinic. There was also a team member not affiliated with the rural primary care clinic who would call on a weekly basis for clinical support.

Effort/Motivational Barriers

It appeared that fear prevented patients from being involved in the CCBT program for a variety of reasons, which ranged from social interaction to resistance to change. *"Patients would rather have medication then having others involved, patients want a quick fix rather than wanting to talk about their feelings."* Among those who dropped out of the CCBT program, both a lack of commitment to engaging in self-disclosure and resistance to treatment were viewed as central factors. *"There is a large population who are living with depression; however, they are unwilling to talk about it. It's more something you don't talk about due to stigmatization. People find the cognitive exercise unpleasant because it is difficult to turn inward and to analyze your own thoughts and feelings."*

Staff Resistance/Frustration

Staff seemed frustrated with the project themselves in terms of their efforts to engage patients repeatedly in the intervention. *"Another problem is oversaturation, where we've asked patients more than once."* Although staff were positive about the intervention, the repeated refusals from patients to enroll made them grow weary about the feasibility of engagement.

Support Themes

Readiness to Change/Symptom Severity

On the other hand, clinician explanations of engaged patients seem to reflect that these patients were more than likely already in the contemplation stage of change rather than the pre-contemplation stage of change. *"At this point the patients are suffering moderately to severely and they are more willing to try and work on it. Their depression is really bothersome and their PHQ-9 scores are very high."* Given that participation was enhanced among patients with higher scores on the PHQ-9, this may reveal that a tipping point exists that pushes patients to be willing to try 'anything' to experience an improved mood. Active involvement in overcoming the inertia of depression also seemed to lead involved patients to feel a sense of accomplishment as they began to experience relief from symptoms of depression. Moreover, clinicians reported that some patients had become frustrated with long-term unsuccessful use of anti-depressant medications, leading them to seek alternatives, for example, *"Patients wanting to attempt something new for their mental health."*

Incentives and Program Supports

Some patients who were engaged in CCBT explained that an additional incentive included receiving gift cards for participation. The provision of loaner laptops to participants was well received when utilized for administering satisfaction questionnaires. Therefore, the distribution of laptops likely also encouraged participation in CCBT. *"[For our] patient satisfaction survey. An iPad was given to patients where they answered 10 questions, it was brief and discreet and the patients really liked the format."*

Clinician Support

Clinicians believed weekly calls by therapists enhanced client participation and engagement in CCBT. Clinicians reinforced skills and provided coaching in their application to daily life on these calls. Patients also viewed the use of occasional therapeutic text messages as motivators encouraging further participation. "*We encourage patients to interact with others…n. Sometimes if patients are taught ... techniques, they will be more successful in their efforts to work on their depression."*

Components of the Intervention

Professionals thought that the use of small goals inherent to CCBT was central to increasing motivation. Staff reported that patients viewed handouts containing visual aids such as graphs, tables, or bullet points as preferable to longer reading assignments. Patients told therapists that being assigned incremental tasks was helpful in increasing their motivation for change. They also indicated that increasing incentives would increase motivation. One physician commented that stated, *"Completers like the videos better than the reading component. Visual aids are preferred by patients."*

Individual Variables

Clinicians reported that CCBT appeared to work better with patients with higher education and higher socioeconomic status. One participant reflected, *"Education level plays a role in the acceptability of these interventions."* Patients with higher levels of education may also be more familiar with, and therefore receptive to, the assignment and homework components of CCBT. These individuals may also experience higher levels of mastery, and therefore less anxiety, surrounding their language abilities, especially regarding reading and written expression skills.

Discussion

Summary of Findings

The results of this study are consistent with previous research on barriers to mental health treatment, such as poverty (Fox et al., 2009), older age (O'Connor et al., 2018), stigma (Barley et al., 2011; Stewart et al., 2019; Vallury et al., 2015); and technology constraints (Federal Communication Commission, 2016). Through these focus groups, clinicians attempting to enroll

patients in this RCT on CCBT in primary care identified that patients of lower socioeconomic status and older age were less receptive to the intervention. These focus group participants also described the ways that stigma about mental health diagnosis and treatment continues to impact rural patients' willingness to engage in this intervention, despite the use of technology in their own home. Stigma prevented patients from choosing to enroll in the program because of the negative connotations of a depression diagnosis and therapy of any type. Lastly, although the trial offered loaner laptops and mobile hotspots for patients, technology continued to be a barrier for some patients due to lack of comfort using the technology provided.

In addition to these areas of consistency with prior research on barriers to mental health treatment in rural settings, this study added new findings to the literature on barriers to this type of treatment. New barriers identified through this study include distrust of outsiders, effort/motivational barriers, and staff resistance. Other key lessons learned on strategies to enhance participation included targeting patients with higher readiness to change or symptom severity who had more motivation for new types of treatment, use of program supports and incentives, clinician support, and components of CCBT itself, such as incremental tasks and goal setting. The finding that clinician support was a facilitator of engagement is consistent with the literature on the importance of clinician contact to supplement CCBT (Wright et al., 2019).

The barriers and general difficulty with enrollment of rural patients in this CCBT intervention contradict previous findings that rural and urban patients were equally open to CCBT (Vigerland et al., 2014). This may reflect unique challenges of the recruitment of patients in a rural setting in this particular southern state, which is influenced by the Appalachian cultural values and mores described above in addition to general rural barriers of stigma, technology and others. However, the relative effectiveness of CCBT for urban and rural patients established in the literature (Shah et al., 2019; Wong et al., 2019; Vallury et al., 2015) has yet to be examined for this study. Analysis of the depression outcomes for urban and rural patients will be conducted and reported in future publications.

Limitations and Future Research

One limitation of this research was the facilitation of focus groups with providers only. An area of future research should be focus groups with patients from the rural setting. The clinicians shared their perspectives on why patients did not participate, often sharing direct quotes or experiences, but the validity of this data would be increased if derived directly from the patients. Another limitation of this research is associated with the patient demographics for this rural primary care site. The majority of patients in the rural sample were older in age, confounding the role of rurality with age as barriers to use of technology for mental health. Previous research has demonstrated that older persons are less comfortable with technology and therefore less likely to use technology-based mental health interventions (O'Connor et al., 2018). Therefore, these results may reflect rural cultural or logistical barriers, but may also be reflective of the older population. The patient population at this primary care clinic was fairly stable, posing a limitation for additional enrollment opportunities. The clinicians expressed frustration with repeated efforts to enroll the same patients in the program. More lessons could be learned with additional rural sites or sites with wider patient variability. Other limitations include the use of only one rural site and the small number of patients enrolled at this site.

Implications

There are several important implications of this research. First, technology-based mental health interventions may not be a universal solution to barriers to access for rural populations. Careful consideration must be given as to how these interventions are offered and the supports needed to maximize effectiveness. For example, technological supports such as tablets and mobile hotspots or financial incentives that can be used to offset these types of costs, should be considered to encourage involvement. Referral to these types of interventions must come from those who are familiar and trusted in the community and not outsiders. For example, encouragement to participate by physicians or nurses that have provided their care for many years is much more likely to be effective than referral by project staff.

Second, consider targeting specific groups in the rural population. There were several themes identified in this research around motivation, readiness to change, severity of depression, and previous failed treatment. Providers should maximize efforts and resources by targeting those with greater readiness to change and motivation based on previous failed attempts and continued severity of symptoms. Other characteristics that may be predictive of success are education and age. Those who higher levels of education and younger age are more likely to participate. More research is needed on strategies to overcome barriers for those with lower education and socioeconomic status and older age, as these vulnerable groups continue to need treatment but are difficult to engage in these types of programs.

Lastly, the same barriers that apply to general mental health treatment also apply to technology-based treatment for rural patients. Stigma remains a significant barrier to participation in any mental health treatment, including computerized cognitive behavioral therapy. This is particularly true for rural populations, with whom self-reliance and general skepticism of mental health issues are sometimes core beliefs. Despite the opportunity for technology to overcome issues of confidentiality or privacy for rural residents, concerns about participation remain. Efforts must continue to normalize mental health diagnosis and treatment in all communities, particularly in rural settings where stigma serves as a major barrier to progress.

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