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RUNNING HEAD: PERCEPTIONS OF A COMPUTERIZED CBT PROGRAM

Exploring Perceptions of a Computerized Cognitive Behavior Therapy Program in a U.S. Rural Western State

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Health Innovations have been reviewed by Montana State University, and his involvement with this research project has been approved in accordance with its conflict of interest policies.

Abstract

Computerized mental health interventions have the potential to address existing mental health care disparities in rural communities. The aim of this study was to conduct an exploratory examination on the acceptability of an interactive computerized cognitive behavior therapy program to reduce depressive symptoms for adults in a rural Western state. Partnering with the land-grant university Extension system and a state non-profit organization, we identified and interviewed 18 key informants and conducted 19 focus groups in 15 rural communities to ascertain attitudes and perspectives about the program. Key informants were provided access to the Thrive program prior to the interviews. Focus group participants were provided a brief demonstration of the program and asked to provide feedback. Content analyses of interview and focus group transcripts yielded four general themes of program acceptability: privacy, accessibility, user-friendliness, and cultural appropriateness. Overall, participants indicated that the Thrive program would be useful for many in their communities. They also reported that the program could be improved by making videos that better represent rural community members' lifestyles and experiences. The study team members acted on these findings to improve the Thrive program for rural Western populations.

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Compared to U.S. urban counterparts, rural communities face significant barriers to using mental health care services. Challenges to providing mental health care for rural Americans include shortages of professional services, long distance to services, financial cost, and stigma regarding mental illness (Larson & Corrigan, 2010; Reed, Messler, Coombs, & Quevillon, 2014; Schopp, Demiris, & Glueckauf, 2006; Thornicroft, 2008; Yellowlees, Marks, Hilty, & Shore, 2008). These challenges suggest a need to identify and examine new methods of delivering mental health care to rural communities.

Montana exemplifies the mental health care challenges among rural communities in U.S. Western states. Roughly 44% of Montana's population is classified as rural or frontier (U. S. Census Bureau, 2010). According to the 2016 Behavioral Risk Factor Surveillance System data, Montana has a higher prevalence of depression compared to the entire nation (19.5% versus 17.4%) (Centers for Disease Control and Prevention, 2017), which may be partly explained by greater periods of inclement weather, higher poverty rates (Haynes & Schumacher, 2016), and agricultural-based stressors (Fraser et al., 2005) experienced by many rural residents. Much of rural Montana has a starkly deficient quantity of mental health care providers to meet community members' mental health care needs (Kaiser Family Foundation, 2016). Compounded with lengthy travel distances to providers and frequent poor seasonal travel conditions, rural Montanans experience substantial barriers to receiving appropriate mental health care. Combined, these challenges suggest a need for an alternative way to provide mental health care resources to the state's rural residents.

One potential solution to the rural mental health care challenges is computerized versions of Cognitive Behavior Therapy (CBT). CBT is the most studied evidence-based psychotherapy for common mental disorders such as depression, anxiety, and post-traumatic stress disorder (Butler, Chapman, Forman, & Beck, 2006; van Zoonen et al., 2014). CBT also has demonstrated long-term protective effects against recurrent major depression (Biesheuvel-Leliefeld et al., 2015; Vittengl, Clark, Dunn, & Jarrett, 2007). With increasing access to broadband Internet, digital mental health interventions have been promoted as an effective cost-efficient solution to many of the mental health care access barriers experienced by rural communities (Schopp et al., 2006). Computerized CBT (cCBT) programs have shown similar positive short-term and long-term effects in treating depression when compared to clinician-provided treatment (Andersson, Topooco, Havik, & Nordgreen, 2016; Richards & Richardson, 2012) and when administered in routine care (Alaoui, Hedman, Ljotsson, & Lindefors, 2015; Hadjistavropoulos, Nugent, Alberts, Staples, Dear, & Titov, 2016; Nordgreen, Gjestad, Andersson, Calbring, & Havik, 2018; Ruwaard, Lange, Schrieken, Dolan, & Emmelkamp, 2012).

Understanding the acceptability of computerized mental health interventions is an important component of determining the efficacy of delivering such programs to communities (Musiat, Goldstone, & Tarrier, 2014). The acceptability of cCBT programs has been demonstrated in rural communities in other countries (Vallury, Jones, & Oosterbroek, 2015). For example, one Australia-based study demonstrated a 97% satisfaction rate among cCBT users (Kay-Lambkin, Baker, Kelly, & Lewin, 2012); Similarly, 92% participants of a Scotland-based study expressed that cCBT helped them with depression and substance use (Hayward, MacGregor, Peck, & Wilkes, 2007). However, there is a lack of research showing the acceptability of cCBT programs in rural U.S. populations. Therefore, the goal of this study was

to ascertain U.S. rural Western attitudes and perspectives regarding Thrive, a cCBT program designed to reduce depression symptoms among adults. Specifically, we wanted to understand the acceptability of the Thrive program as a tool to reduce a spectrum of depression symptoms among adults residing in a U.S. Western rural state.

Methods

Program Description

Thrive is an internet-based CBT program designed for adults with depression symptoms. First developed and studied as an interactive voice response telephone program (Osgood-Hynes et al., 1998), it was subsequently converted for administration on the Internet and improved by reducing text and implementing use of videos, making the program more engaging and effective for individuals (program users) with lower literacy. Thrive has since been further developed to operate on smartphones, tablet devices, and computers. The program is comprised of three modules: assertive communication, constructive thinking, and rewarding activities. Thrive places a heavier emphasis on video than text content with the intent to improve participant engagement. As an algorithm-based program, Thrive obtains periodic self-reported assessments of depressive symptom severity and uses participant responses to assessments to tailor messaging and support to the program user. Thus, there is no human to human interaction involved. The program also provides safeguards and guidance if the program is not working effectively. For example, if a user indicates no improvement during use of the program, a scripted message will suggest they consider finding personalized help outside the program. Users who indicate having had thoughts of suicide prompt the program to provide a follow-up question to determine whether they can keep themselves safe and to seek immediate help if they do not confirm safety. The program provides users with several resource suggestions, including the 1-800-273-8255

(TALK) suicide prevention hotline and Now Matters Now organization website (<https://www.nowmattersnow.org/>). Although users may advance through each module at their own pace, Thrive automatically reminds them with weekly emails to continue using the program. Waypoint Health Innovations, the owner of Thrive, provides it to healthcare organizations at a rate of \$125 per enrollment, with volume-based discounts available.

Procedures

This study was approved by the [blinded for review] University's Institutional Review Board. The study Principal Investigator (PI) partnered with the state Extension system and a local non-profit organization to effectively promote the study and recruit study participants. Extension is the outreach arm of the university taking research-based information out to constituents across the state through non-credit classes and the provision of other educational resources. County Extension Agents identify local needs and provide classes and resources to communities on a variety of topics. The second partner, a non-profit organization, has a mission to bridge the urban-rural divide on many diverse issues. Thus, the core research team included the study PI (MB), an Extension faculty member (SB), a projects manager of the non-profit organization (BB), and a community health graduate student (MH). The first three team members conducted the key informant interviews and focus groups. Participants for this study were selected based on their interest in the subject of mental health issues in their respective communities. To participate in the study, participants needed to be aged 18 years or older and speak fluent English. Two methods of qualitative data collection, focus groups and key informant interviews, were used to assess the acceptability of the Thrive program and to determine the feasibility of offering the program in participants' communities. Team members

conducted 19 focus groups (19 males and 82 females) and 18 key informant interviews (3 males and 15 females) in 15 counties selected with the help of research partners to assure all areas of the state were represented. Interviewers and focus group facilitators used a predetermined list of questions to guide each session (Table). Focus group and interview sessions were audio-recorded with study team members taking additional notes. The audio files were then professionally transcribed verbatim. Focus group participants' and key informants' names were removed from transcriptions to maintain confidentiality.

Focus groups are an efficient way to gain information about a topic of interest by those familiar with or interested in the topic. Focus groups typically have 7 to 10 participants who are selected because of their characteristics that relate to the topic presented in the group (Krueger & Casey, 2014). Focus group sessions offer an opportunity for group members to share ideas and experiences with guidance from a trained facilitator. To obtain a suitable representation of ideas, Krueger and Casey (2014) recommend a minimum of three focus groups for a study. Focus group members were presented a short video demonstration of Thrive and asked for input on the acceptability of the program for each respective community. The facilitators also posed questions about community members' attitudes toward mental health and access to mental health. Each focus group lasted approximately 90 minutes with participants receiving \$30.00 stipends for attending.

Semi-structured interviews were conducted with key informants. In community-based research, key informants are community members who have intimate knowledge about the subject and can help the researcher in understanding what is happening in their respective community (Patton, 2005). Key informants were allowed full access to the Thrive program

approximately four to six weeks before being interviewed. Each interview lasted approximately 20 minutes with key informants receiving \$75.00 stipends for participating.

Study Participants

For this study, focus group members comprised a diverse set of community members, including Extension agents, mental health therapists, community health professionals, and other community members interested in mental health. Of the 101 focus group participants, 92% identified as White, 6% as American Indian, and 2% as Hispanic/Latino. The mean age of focus group members was 49 years (range of 22 to 77). Key informants included Extension agents, mental health therapists, and community health professionals. All of the 18 key informants identified as White. The mean age of informants was 49 years (range of 22 to 63). Occupational data was only collected for key informants.

Data Analysis

NVivo qualitative software (Version 11) (QSR International Pty Ltd, 2015) was used for content analysis of focus groups and interviews. Content analysis is a technique where researchers derive valid and reliable contextual meaning in a systematic manner from qualitative data that originate from open-ended interviews and focus groups (Krippendorff, 2012).

Transcribed data were analyzed shortly after completion of each focus group and interview. Saturation of content was reached well before all of the focus groups and interviews were completed. However, team members continued to conduct focus groups and interviews in order to reach a representation from all areas of the state.

Using systematic open coding of interview and focus group transcripts, one of the research team members (MH) conducted the first round of analyses for the interviews and focus groups. Another team member (MS) then reviewed 30% of the coded text and confirmed the

accuracy of coding and the respective emerging themes from the first round of analyses. Themes emerged via open coding technique of respective quotes. A Kappa inter-rater agreement score was calculated to be 97%, indicating a very high agreement level of coding (Cohen, 1960).

Results

We identified four distinct themes regarding the acceptability of the Thrive program in rural regions: privacy, accessibility, user-friendliness, and cultural appropriateness. The themes can be summarized as follows: (1) Privacy refers to being able to use the program confidentially; (2) Accessibility refers to being able to use the program any time of day and not having to travel for traditional care; (3) User-friendliness refers to features of the program that are simple and comprehensible to users; and (4) Cultural appropriateness refers to participants' perceptions of how well the program resonates with the lifestyle and realities of persons residing in rural communities.

Privacy

Many participants (12 key informants and 15 focus groups) expressed that one of the Thrive program's principal benefits is the ability to use it privately. Participants suggested that people suffering from mental illness may be wary of sharing their confidential and sensitive thoughts with a health professional, especially in small, rural towns. Since Thrive is computer-administered, participants can discretely use it in their home or personal office space. Key informant interactions with the program and presentation of the program to focus group participants clearly demonstrated the capacity for confidential use of the program. Emphasizing the benefit of privacy, one female Extension agent (key informant) expressed:

Maybe they don't want to share their feelings and thoughts, and they think it's very personal, and they don't want anybody to know, so this is a place where they can go and not have to tell anybody really. I mean it's very private.

Another female Extension agent (key informant) shared similar sentiments:

I thought it was nice, especially for people who are struggling with mental health issues. If they don't want to speak to someone, you know, in person, they can go through the program online and they don't have to worry about... being judged or just different mindsets that some people have. They don't like talking to people, and so I think that would be super helpful.

Some focus group participants expressed how a program like Thrive may feel more comfortable and safer for them than seeing a therapist. For example, one older-aged female participant stated:

"If I had the choice of pouring my heart out to a shrink or watching this, I'd feel more comfortable watching this [program]. So, some people might feel lonely, but others like us might feel safer."

One older female participant also expressed that, in small rural communities, people may be more likely to be honest with a computer program compared to a physician: "I mean, in all honesty, people might be a little more honest with this than even with their physician. Because there again, like I said, Small Town USA."

Accessibility

In the context of mental health service shortages in their communities, participants (18 key informants and 13 focus groups) expressed the importance of easy access to the Thrive program. For example, one middle-aged female participant stated "Well that's really an important issue, especially in small communities. Because we really have very limited mental

health services, and what we do have is not accessible to a lot of people because of finances.”

Another older-aged male participant emphasized how access to the Internet for such a program would help those lacking transportation. “It can be accessed in areas like this, where, hopefully, we have Internet capacity that someone [can] access when they need, and don’t have the transportation that they need to have other options out there.” Another middle-aged female participant expressed how the program could help fill the gap in needed services. “I think in these rural areas where you don’t have access full time to counselors, therapists, and that sort of thing, I think it sounds like a really good tool.”

One middle-aged female therapist (key informant) described why a program such as Thrive could help address the work and distance barriers that often face residents in rural communities:

I really love the idea [of the program] and I think it’s just with us working in a rural environment to be able to bring these kinds of therapeutic outlets for people who really don’t have that option because of work, job, transportation, family, and even just the distance.

Flexibility in using Thrive was an additional stated benefit. For example, one middle-aged female key informant stated:

I didn’t go through that whole process, but I liked the ability to kind of set my own schedule, because I have a crazy schedule, so one week I could do it on Monday, the next week I could do it on Wednesday, however I wanted to do that, so I liked that about it.

User-friendliness

Many participants (10 key informants and 17 focus groups) expressed appreciation for the program’s straightforward and easy-to-use design. As one older-aged female wellness

program coordinator (key informant) expressed, “I think it is real clear for anyone to understand – they really stressed step-by-step, so I think it would not be really overwhelming to someone that wasn't in an overwhelming situation.” The program is designed to progress at a comfortable pace so that a user gets manageable amounts of information to process. This design feature was valued by one middle-aged local male park guide (key informant): “...It keeps you moving and it doesn't keep you stuck in one spot, which I appreciated.”

The Thrive program has a design feature by which participants can view multiple videos for learning, provide easy responses to questions, and with program algorithm features obtain tailored messages based on personal responses. One older-aged female participant was particularly impressed by these design features:

The fact that it offers all those different things you can check, and then how severe the feeling is, you feel like it's tailored to you even though it is just a computerized program, and that really impressed me. I mean they thought about a lot of different situations and thoughts and things, and I'm impressed with how comprehensive it is.

Cultural Appropriateness

Some participants (8 key informants and 10 focus groups) voiced concern that many of the video vignettes in Thrive do not adequately represent the experience of rural Montanans. Several of the filmed scenarios, backgrounds, and actors in the program were described as not being relatable enough to everyday scenarios experienced in rural Western communities. For example, many filmed videos involve scenarios that have an urban feel and context. These concerns are illustrated by four study participants: “People are generally pleased with the concept of Thrive. Just wish it was more rural America”

[middle-aged male focus group participant] and “Maybe it would be more applicable to tone it down and make it a more familiar setting and more familiar persons that would be in the rural area.” [female hospital clinician key informant]. One middle-aged female Native American focus group participant stated, “I think it’s too White, to tell you the truth.” Finally, one middle-aged female focus group participant spoke to what she thought needed to be done to make the program more effective for many Montana communities: “It would be definitely really helpful if you could adapt it for our community....”

Discussion

Our study is the first known to investigate the acceptability of a cCBT program for reducing depression symptoms among U.S. rural residents. Our findings suggest that cCBT programs may be an suitable form of care for rural residents and support the feasibility of introducing cCBT programs in these communities, which is comparable to what has been reported among rural communities in other countries (Hayward et al., 2007; Kay-Lambkin et al., 2012; Vallury et al., 2015). Yet, our findings also indicate room for improving such programs by adapting them to rural communities.

Four themes of acceptability regarding cCBT programs emerged from our focus groups and interviews. One theme, collectively captured by selected quotes, focused on the benefits of privacy. Participants emphasized the advantage of being able to use the Thrive program in a confidential manner, with a sense of increased comfort and safety not perceived to be obtainable with real persons. Evidence from our data support the idea that stigma in rural communities remains a significant barrier to seeking mental health care (Jackson et al., 2007; Larson & Corrigan, 2010) and that cCBT programs may offer a solution to circumventing this barrier

(Kay-Lambkin et al., 2012). Additionally, cognitive-based psychotherapies can challenge thoughts of self-stigma by building individuals' skills to think more realistically about their life circumstances (Larson & Corrigan, 2010). Because stigma to seeking mental health care is even greater among men (Jackson et al., 2007), future studies are warranted to test how cCBT program promotional efforts can effectively target at-risk male populations.

A second theme from our study focused on the accessibility of cCBT programs. Although rural communities face barriers to mental health care, they are experiencing growth in access to broadband Internet (Carlson & Goss, 2016). For study participants, accessibility represented a convenience of being able to access these programs at any time without having to travel long distance for traditional care, which takes additional time and money. Furthermore, some participants commented on the lack of existing mental health services in small rural communities, suggesting that being able to access cCBT programs in various settings is beneficial for those living in remote areas where treatment is otherwise absent (Kaiser Family Foundation, 2016). As Andrews and colleagues (2010) noted, cCBT programs' key advantage over traditionally-delivered modes is their accessibility and convenience, with additional benefits of user-satisfaction and ability to track treatment fidelity.

A third theme, user-friendliness, was described by participants as the Thrive program's ability to instruct and guide users in a simplistic fashion even while maintaining a tailored approach to participants' specific inputs. Despite the complexity of the algorithmic features within the program, participants perceived the program's design as simple and the language contained as basic. Thrive is an advanced program of its kind, including over 100 interactive elements with a video-based platform for teaching and demonstrating learning modules. Similar

types of multimedia-based learning platforms are shown to be more impactful and have higher satisfaction than traditional learning platforms (Zhang, 2005).

A fourth theme, cultural appropriateness, describes participants' responses regarding the extent to which the Thrive program effectively captures the experiences of rural residents. Many of the study participants requested that program videos more accurately reflect the profiles and experiences that participants were more familiar with in their communities. Thus, for the program to resonate better with the diversity of experiences and settings known to rural Western residents, program videos would need to be replaced with characters and stories that represent the experiences of rural community members. Rural communities face greater barriers to culturally appropriate mental health care because of a variety of factors, including greater poverty and isolation (Yellowlees et al., 2008). If digital mental health interventions are to be effective with U.S. rural populations, then they should be adapted to the culture and racial diversity of these communities (Barrera, Castro, Strycker, & Toobert, 2013; Schopp et al., 2006). Participants from this study corroborated these perspectives.

To address perspectives regarding suggested program adaptations, team members modified several of the program videos to include rural scenes, profiles, and scenarios. After the data were analyzed, the research team members decided to seek additional funding to act on these perspectives. Thus, the research team partnered with the university's film department to produce 10 new videos to replace original videos. One set of videos depicts the real-life scenario of a ranch manager, another segment a local café attendant, and a third segment of a farmer who loves to fish and hunt. The updated version, now called Thrive-Montana, is currently being evaluated in a randomized control trial for its effectiveness in reducing depression symptoms.

Although this study highlights rural U.S. perspectives on the acceptability of cCBT programs, it is not without limitations. First, our recruitment efforts were met with a gender-skewed participation in nearly all communities, with females comprising approximately 82% of all participants. A more representative sample could have been obtained had each gender group been specifically targeted separately for interviews and focus groups. Similarly, the vast majority of participants identified as White, also limiting generalizability across different racial groups. Also, although Montana is representative of many states in the rural Western America, we cannot claim that these findings would be generalizable to other U.S. regions. Future studies are necessary to examine how cCBT programs may be received in different geographically-diverse rural communities, acknowledging the diversity in cultures, ethnicities, and race.

A second potential limitation is participant and researcher bias. Those who were more likely to participate may have more optimistic or critical tendencies towards cCBT programs. For example, studies have demonstrated mental health professionals' criticism toward cCBT programs on their ability to be a truly effective in improving patients' symptoms (Folker, Mathiasen, Lauridsen, Stenderup, Dozeman, & Folker, 2018; Vigerland, et al., 2014). Potential researcher bias must also be acknowledged since all persons inherently apply preconditioned interpretations regarding qualitative belief statements. We attempted to minimize this type of bias with the presence of at least one note-taker at each focus group and having all research team members provide verification of each respective theme and supporting quotes.

Conclusions

In sum, our findings show that cCBT may be acceptable in rural Western communities, yet the potential of cCBT programs in this country to help rural residents with depression symptoms has yet to be examined. This study supports growing evidence that cCBT programs

may be a part of viable solutions to the mental health care challenges faced by rural communities (Hayward et al., 2007; Yellowlees et al., 2008). Study participants emphasized the importance of adapting cCBT programs to rural community's values and norms. If digital mental health programs are to be maximally relatable and effective, researchers would be wise to consider culturally competent ways to adapt and deliver such programs (Yellowlees et al., 2008). Future studies are warranted to examine the efficacy of culturally-adapted cCBT programs to reduce depression symptoms in U.S. rural communities. As evidence accumulates, policymakers and practitioners should examine the implications of funding and adopting cCBT programs to effectively reduce existing mental health care disparities in rural American communities.

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Table

Focus group and key informant interview questions

Focus Group Guide Questions

What are your thoughts about using a computer program on the internet to treat depression?

What are your initial impressions of this program?

What do you like about the program?

What did you dislike about the program?

What could make the program better?

What parts of the program seem most helpful? How are they helpful?

Would you recommend Thrive to people dealing with depression? Why or why not?

How would you get others in your community to use this program?

Key Informant Guide Questions

What were your impressions of Thrive?

What was your understanding of what would be expected of you throughout the program?

Can you share with me how you used the program over the period of time you spent with it?

Can you share with me your experience using the: Behavioral activation module? Cognitive restructuring module? Social Skills module?

Which components of the program were most helpful? Why?

What did you like about the program? Why?

What did you dislike about the program? Why?

What changes would make Thrive more useful for those with depression?

Would you recommend Thrive to others dealing with depression? Why or why not?
