

mHealth for Mental Health: User-Centered Design and Usability Testing of a Mental Health Application to Support Management of Anxiety and Depression in African American Women

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# Agenda

- Background
- Focus Groups
- Usability Testing
- Takeaways
- Conclusions
- Next Steps

# Background

Approximately 1 in 5 African American women experienced mental illness in the past year

- Prevalence of mental illness among African American women is comparable to the general population (20.6% vs. 19.1%)
- However, they use mental health services at less than half the rate of their white counterparts (10.2% vs. 27.2%)
- 15.7% of non-Hispanic Black women reported having generalized anxiety in their lifetime
- 27.4% of non-Hispanic Black women reported experiencing depression in their lifetime

# Mental Health Service Use

Approximately 70% of African American women that reported experiencing mental illness in the last year did not receive treatment

#### **Barriers to receiving care**

- Higher levels of stigma in the Black community
- Less access to treatment
- No or inadequate health insurance coverage

- Lack of professionals who share their socio-cultural background
- Mistrust of providers
- Low health literacy



#### **Barriers to Seeking Care Among African American Women**

The top 10 reasons for not seeking mental health treatment or counseling when needed (N = 261 out of 304)

Reasons*		
1.	You could not afford the cost	71 (23)
2.	Your health insurance does not pay enough for mental health treatment or counseling	37 (12)
3.	You did not know where to go to get services	32 (11)
4.	Lack of time	30 (10)
5.	Your health insurance does not cover any mental health treatment or counseling	20 (7)
6.	You were concerned that getting mental health treatment or counseling might have a negative effect on your job	20 (7)
7.	You were concerned that you might be committed to a psychiatric hospital or might have to take medicine	19 (6)
8.	Hard to find preferred provider	14 (5)
9.	You were concerned that the information you gave the counselor might not be kept confidential	11 (4)
10	Decided not to seek mental health treatment or counseling	7 (2)

<sup>\*</sup>A total of 304 responses were given, however only the most common reasons are presented in the table (n=261). Therefore, percentages will not sum to 100%. Participants were permitted to select all responses that apply.

#### **Access and Convenience**



Sample percentages, by age group, for response to the statement, "Would having the option to use a mobile app to complete an appointment with a professional increase your access to mental health services?"

#### Access and Convenience continued



Sample percentages, by age group, for response to the statement, "Would having the option to use a mobile app to complete an appointment save you time traveling to a professional's office?"

#### Access and Convenience continued



Sample percentages, by age group, for response to the statement, "Would having the option to use a mobile app to complete an appointment with a professional be more convenient for you than an in-person appointment?"

#### mHealth for Mental Health

- mHealth interventions for anxiety or depression significantly reduced symptoms post-intervention (p < 0.05)</li>
- African American women are comfortable with participating in mHealth research and interventions
- 80% of African American women own smartphones
- On average, they spend approximately19 hours per week using smartphone apps
- Current tools are not consistently usable for diverse patients



## Purpose of the Study

- 1. Determine what content, features, and considerations should be included in an app tailored to support management of anxiety and depression in African American women
- 2. Evaluate the usability of the app



# **Focus Groups**

#### **Focus Group Methods**

**Setting:** Sessions were held at a Durham County library and at UNC-Chapel Hill in January 2020

**Sample population:** Women (18 years or older) who identify as Black/African American (or multiracial, Black/African American and another race)

**Recruitment methods:** Survey respondents, social media posts, and flyers

**Incentive:** \$25 Amazon gift card and a mental health resources information sheet



Participate in a research study about the attitudes of Black women towards using mental health services, and the acceptability of using mobile technology to deliver mental health services and resources. Focus group participants will receive a \$25 Amazon gift card.

#### You may be ELIGIBLE if:

- You are a Black/African American woman (18 years or older)
- You are able to attend a focus group at UNC Chapel Hill or a Durham County library

A clinical diagnosis of anxiety or depression is NOT required to participate in the study Your participation is completely voluntary. For more information about the study, or to find out if you are eligible to participate, please contact Terika at tmccall@unc.edu



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## Focus Group Methods continued

**Design:** Conducted by a moderator, and notetaker present

#### **Topics:**

- Past and current causes of anxiety and depression; coping skills used
- Attitudes and perceptions towards mental illness and receiving mental health treatment
- Content and features needed in a smartphone app designed to help African American women manage anxiety and depression
- Barriers and facilitators to use of a smartphone app for mental health care

#### **Qualitative Data Analysis Plan**

- Audio files transcribed and imported into NVivo 12
- Thematic analysis conducted
- Reoccurring themes across the focus groups were noted



## Sociodemographic Characteristics of Focus Groups (N=4)

- 4 focus group sessions with 5 participants each (20 total)
- Black/African American or multiracial (i.e., Black/African American and another race) women
- Mean age 36.6 years (SD 17.8, range 21-79 years)

- 75% (15/20) less than 50 years old

## Past App Use for Mental Wellness

- Mental health and wellness apps that had the following features:
  - Meditation
  - Mood tracking

- Calorie intake and activity monitoring
- Deep breathing exercises
- Music apps and podcasts (e.g., Therapy for Black Girls)
- Inspirational messages on social media apps



## **User-centered Recommendations**

#### Content

- Information to find a Black woman therapist
- Guidance on how to deal with common stressors (e.g., microaggressions, imposter syndrome, relationships)
- Upcoming events in the area to connect with other Black women
- Inspirational messages and encouraging stories
- Daily uplifting and supportive messages
- Suggested readings that promote mental wellness
- Information on financial assistance

#### Features

- Anxiety, depression, and mood tracking
- Guided meditation, deep breathing, and other coping techniques narrated by a Black woman
- Group chat rooms to connect with other users
- Ability to connect with a preferred therapist through the app via messaging or video call



#### **Daily Active Use**

- App must promote a sense of community
- Ability to connect with a therapist
- Guidance to learn coping skills to managing anxiety and depression
- Short exercises to help manage anxiety and depression
- Clean user interface
- Intuitive and easy to use
- Provide tutorial on how to use the app
- Accountability features (e.g., mood check-in)
- Gamification (e.g., earned stars for completing a task)
- Limit notifications

#### Trust

- Transparency on who created and owns the app
- Transparency on how user data is protected
- Clearly stated policies on data ownership, use, and data sharing
- Confidentiality and privacy concerns must be addressed about communicating with a mental health professional through the app

# Content

- Information to find a Black woman therapist
- Guidance on how to deal with common stressors (e.g., microaggressions, imposter syndrome, relationships)
- Upcoming events in the area to connect with other Black women
- Inspirational messages and encouraging stories
- Daily uplifting and supportive messages
- Suggested readings that promote mental wellness
- Information on financial assistance





Regarding information to find a therapist, a participant voiced she would like to be able to:

*"Find Black women therapists in the area, with also listing what insurances they take, their hours, all that good stuff, because, again, those barriers. People are just like, "Where are these people?"* 

[Speaker 4, Group 2, 23 years old]

#### Features

- Anxiety, depression, and mood tracking
- Guided meditation, deep breathing, and other coping techniques narrated by a Black woman
- Group chat rooms to connect with other users
- Ability to connect with a preferred therapist through the app via messaging or video call



Regarding features to track anxiety, depression, and mood, a participant voiced she would like:

"If you could have a history in there and then you could look back and see when the last time was that you had this anxiety and what helped when you have this anxiety attack or whatever. You don't just end it with what you see. You can write down what helped and then you can go back to that." [Speaker 3, Group 1, 63 years old]

# **Daily Active Use**

- App must promote a sense of community
- Ability to connect with a therapist
- Guidance to learn coping skills to managing anxiety and depression
- Short exercises to help manage anxiety and depression
- Clean user interface, intuitive and easy to use
- Provide tutorial on how to use the app
- Accountability features (e.g., mood check-in)
- Gamification (e.g., earned stars for completing a task)
- Limit notifications





Regarding providing some type of incentive to use the app, one participant stated:

"Although it would be a superficial incentive, I feel just like apps that keep track or give you stars or anything that I guess signifies that you've completed something in itself can be validating to people, especially good habit building and stuff like that." [Speaker 5, Group 1, 23 years old]

#### Trust

- Transparency on who created and owns the app
- Transparency on how user data is protected
- Clearly stated policies on data ownership, use, and data sharing
- Confidentiality and privacy concerns must be addressed about communicating with a mental health professional through the app





Regarding data sharing and use, a participant voiced her concern stating:

"I was watching the news on the treadmill last night, two nights ago, and they were talking about how these big companies on these dating apps are selling data, and so I would be worried about who has control over the data that's happening in the app, and what are they going to do with it now that they have all this information about Black women? [Speaker 1, Group 2, 27 years old]

# **Usability Testing**

# TherapyLink



# **Usability Testing Methods**

**Setting:** Sessions were held in the UNC-Chapel Hill School of Nursing's Biobehavioral Lab

**Sample population:** Women (18 years or older) who identify as Black/African American (or multiracial, Black/African American and another race)

**Recruitment methods:** Social media posts, flyers, and Research for Me @UNC recruitment listing

Incentive: \$25 Amazon gift card

<text>

Participate in a research study testing a mobile app that is being designed to help African American women manage anxiety and depression. Study participants will receive a \$25 Amazon gift card.

You may be ELIGIBLE if:

• You are a Black/African American woman (18 years or older)

• You are able to attend a session to test the app at UNC School of Nursing

A clinical diagnosis of anxiety or depression is NOT required to participate in the study. Your participation is completely voluntary. For more information about the study, or to find out if you are eligible to participate, please contact the study team at mhealth4mentalhealth@unc.edu or 919-636-9198.

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# Usability Testing Methods continued

**Design:** Cognitive Walkthrough Method was used to evaluate the user interface design on how well it supports users in learning to complete tasks

- Tobii Pro Glasses 2 and software were used to record the session (including taps, eye movements, and time spent on each task)
- Participants were read the persona and scenario and then asked to begin the 4 tasks
- Questionnaire for User Interface Satisfaction (QUIS) administered



#### Tasks

#### Scenario #1 Tasks:

- Find out your levels of anxiety for the past 6 weeks
- 2. Find information on how to manage anxiety
- 3. Add a new entry to your journal
- 4. Locate a therapist to schedule an appointment

#### Scenario #2 Tasks:

- 1. Find out your levels of depression for the past 6 weeks
- 2. Find information on how to overcome depression
- 3. Create a self-care plan
- 4. Locate a therapist to schedule an appointment

# **Data Analysis Plan**

Quantitative data analysis plan:

- Descriptive statistics
- QUIS scores
- Efficiency measures (time to complete each task, number of taps)

Qualitative data analysis plan:

- Heat maps
- Feedback from cognitive walkthrough session

Characteristics of Usability Testing Participants (N=15)

#### Age

 Mean age 29.8 (SD 12.4, range 20-66 years)

#### Race

 All identified as either Black/African American or multiracial

#### Education

 86.7% had a bachelor's degree or higher

#### Mobile App Use

 93.3% used mobile apps 4 or more times per day

## **Questionnaire for User Interface Satisfaction Scores**

Summary of Mean Scores for the Five Domains of the Questionnaire for User						
Interface Satisfaction for Scenario #1 and Tasks (N=8)						
Domain	Minimum	Maximum	Average of			
Domain	Mean Score	Mean Score	Means (SD)			
Overall Reactions to the Software	5.8	9.0	7.2 (1.1)			
Screen	6.0	9.0	7.3 (1.3)			
Terminology and App Information	5.8	9.0	7.6 (1.3)			
Learning	5.0	9.0	8.0 (1.3)			
App Capabilities	6.2	9.0	8.3 (0.9)			

#### Questionnaire for User Interface Satisfaction Scores continued

Summary of Mean Scores for the Five Domains of the Questionnaire for User						
Interface Satisfaction for Scenario #2 and Tasks (N=7)						
Domain	Minimum	Maximum	Average of			
	Mean Score	Mean Score	Means (SD)			
Overall Reactions to the Software	6.0	8.7	7.5 (1.0)			
Screen	6.3	9.0	8.0 (1.0)			
Terminology and App Information	7.0	9.0	8.4 (0.8)			
Learning	7.6	9.0	8.2 (0.5)			
App Capabilities	8.3	9.0	8.8 (0.3)			

# Efficiency

- Most participants were able to fully complete each task with limited to no assistance
- Creating a journal entry proved to be the most time consuming and cumbersome task
- The differences in time to complete each task were primarily due to typing speed or using an alternate method to search

Eye Tracking using Tobii Pro Glasses 2





# **Recommendations for App Development from Usability Testing**



- Intuitive and easy to use
- Visually appealing interface with clear labelling
- Place important information on the left side or middle of the screen

# Limitations

#### **Focus Groups**

- Most under 50 years old
- Social desirability bias

#### **Usability testing**

- Geographical restriction
- Most under 50 years old
- Personal preferences
- Efficacy of app to reduce anxiety and depressive symptoms not measured

# Takeaways

- Findings consistent with previous literature which highlight the need for educational, psychotherapy, and personal development components
- Tailoring needed to address specific needs and interests of African American women
- Use of preferred resources and app features will help researchers and developers create apps that are both useful and "sticky"



#### Takeaways continued

- The design preferences of the study participants confirm the importance of incorporating trust-centered design components
- Important to design health information technologies for:
  - Stigma reduction
  - Social support exchange
- Incorporating user-centered design requirements of intended users may help them become more engaged and feel empowered

#### Conclusions

- 80% of African American women own a smartphone
- Great opportunity to use mobile technology to provide mental health resources and services
- A one-size-fits-all approach to designing mHealth interventions may lead to more options but continued disparity in receiving mental health care
- To increase the likelihood of adoption, mHealth interventions should be culturally-tailored

# **Next Steps**

- Focus groups with <u>20</u> African American women to receive feedback on the upgraded prototype
- Usability testing sessions with <u>8</u> African American women to evaluate the upgraded prototype
- 8-week pilot study to evaluate the smartphone app prototype among <u>80</u> African American women with moderate to severe anxiety or depression (GAD-7 or PHQ-9 score ≥ 10)
  - Evaluate the feasibility, acceptability, and estimate the effects of the mHealth intervention on anxiety and depressive symptoms

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# Yale school of medicine



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