'Somali? Muslim? Hey, you already got me': Acceptability of Islamic Problem-Solving and Stress Management Techniques in Adapted Problem Management Plus (PM+) Intervention Among Somali Muslim Women

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Abstract

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Abstract

Background: Somali Muslim women in King County face significant mental health challenges, with PTSD prevalence of 33-80% and high rates of depression and anxiety. Cultural gaps between Western therapeutic approaches and Islamic healing paradigms create barriers to accessing mental health services. This study examined the acceptability of Islamic adaptations integrated into Problem Management Plus (PM+) among Somali Muslim women.

Methods: A sequential exploratory mixed-methods study was conducted with 10 Somali Muslim women who participated in culturally adapted PM+ sessions. Islamic adaptations included incorporating du'as with breathing exercises, using Prophet Muhammad's problem-solving approaches, framing stress management within Islamic concepts, and aligning activities with prayer times. Data collection included interviews and a 7-item acceptability survey. Qualitative data were analyzed using systematic coding based on detailed operational definitions for 3R strategies (Reframing, Reprioritizing, Reforming) and implementation outcomes (acceptability, appropriateness, feasibility, sustainability).

Results: Participants demonstrated high acceptance: 9/10 strongly agreed with acceptability items, 8/10 with appropriateness items, and 7/10 with feasibility items. Three themes emerged: Religious Familiarity and Recognition, Integration of Religious Coping with PM+ Techniques, and Community Implementation considerations. Participants described Islamic adaptations as creating "powerful combinations" that enhanced rather than replaced evidence-based techniques.

Conclusions: Islamic integration significantly enhanced acceptability of evidence-based mental health interventions among Somali Muslim women. The enhancement model, where religious practices amplify rather than compromise therapeutic effectiveness, offers a promising approach for culturally responsive mental health care in refugee communities.

Introduction

Problem Statement

Somali refugee women face unique mental health challenges shaped by pre-migration trauma, post-migration stressors, and cultural and religious factors that influence their understanding of mental health and help-seeking behaviors (Lincoln et al., 2021; Mohamed, 2018). Seattle's metropolitan area hosts the third-largest Somali community in the United States, with approximately 30,000 Somali residents in King County (Mohamed, 2018). Studies with Somali refugees have found Post Traumatic Stress Disorder (PTSD) prevalence ranging from 33-80%, with additional high rates of depression and anxiety (Bhui et al., 2003; Kroll et al., 2011).

Despite this substantial burden of mental health conditions, significant gaps exist between Western biomedical approaches to mental health and the Somali community's cultural and religious healing paradigms. These gaps create substantial barriers to accessing appropriate mental health services, with many community members avoiding services that conflict with their religious beliefs or cultural understanding of mental health (Mohamed, 2018; Pavlish et al., 2010). The importance of addressing this problem extends beyond individual suffering to community wellbeing and public health impact. Mental health conditions left untreated can affect entire families and communities within the collectivist Somali cultural context. Furthermore, the lack of culturally appropriate mental health interventions represents a significant health equity issue, as it effectively excludes a vulnerable population from accessing evidence-based mental health care that could substantially improve their quality of life and functioning.

Problem Management Plus (PM+) is an evidence-based intervention developed by the World Health Organization to reduce psychological distress among populations exposed to adversity (World Health Organization, 2016). It consists of five weekly sessions delivered by trained non-specialists and includes components on stress management, problem-solving, behavioral activation, and strengthening social support. PM+ has demonstrated effectiveness with Syrian refugees and other migrant groups in reducing symptoms of anxiety and psychological distress for up to one-year post-intervention (de Graaff et al., 2024). However, standard implementations often lack cultural and religious adaptations needed for effectiveness with Muslim populations. For example, standard PM+ breathing exercises do not incorporate Islamic spiritual practices like du'as (supplications), and problem-solving components lack integration with Islamic theological frameworks that emphasize concepts like tawakkul (reliance on Allah) and sabr (patience).

In response to this need, our research team developed culturally adapted versions of PM+ that incorporate Islamic practices and principles central to the healing processes of Somali Muslim women (Keshavarzi & Haque, 2013). These preliminary adaptations included integrating du'as with breathing exercises, incorporating Prophet Muhammad's (peace be upon him) problem-solving approaches as models, and framing stress management within Islamic conceptual frameworks. The adaptation process involved collaboration with Somali community members, religious leaders, and mental health professionals to ensure cultural authenticity and religious appropriateness.

This study evaluates women's perceptions of these preliminary adaptations to understand their acceptability. The primary research question guiding this work is: **What is the acceptability of Islamic problem-solving and stress management techniques integrated into adapted PM+ among Somali Muslim women?** Additional questions include: (1) How do Somali Muslim women experience the integration of Islamic practices into the PM+ framework? (2) What adaptations are considered most

culturally appropriate and feasible by participants? Given the documented barriers to mental health care access in Somali communities and the potential for culturally adapted interventions to bridge these gaps, understanding participant perspectives on Islamic integration within evidence-based frameworks is essential for developing effective, culturally responsive mental health services.

Literature Review

Cultural Influences on Mental Health and Religious Tailoring

Mental health experiences, expressions, and help-seeking behaviors are fundamentally shaped by cultural contexts. The Cultural Influences on Mental Health framework recognizes that culture profoundly impacts how individuals understand, experience, and respond to psychological distress (Hwang et al., 2008; Kirmayer et al., 2011; Kleinman, 1980). This framework is particularly relevant when examining mental health within Somali refugee communities, where cultural and religious values deeply influence conceptualizations of wellbeing and illness.

This study is guided by two complementary theoretical frameworks: the 3R Model for religious tailoring of health interventions (Padela et al., 2018) and the Implementation Outcomes Framework (Proctor et al., 2011).

The 3R Model provides a structured approach for understanding how religious practices can be integrated into evidence-based interventions to modify health behaviors through three strategies: Reframing, Reprioritizing, and Reforming. Reframing involves introducing alternative interpretations of barrier beliefs within an Islamic framework that normalize beliefs while facilitating health behaviors. Reprioritizing introduces facilitative Islamic beliefs that align with health behaviors to instill greater resonance and motivation. Reforming addresses misconceptions by uncovering logical flaws or misinterpretations of Islamic teachings specific to mental health. This framework guides our analysis of how Islamic practices are incorporated into PM+ and how these adaptations influence participants' engagement with stress management techniques.

The Implementation Outcomes Framework complements the 3R Model by providing metrics to evaluate adaptation effectiveness through four key dimensions: acceptability (is it agreeable or satisfactory?), appropriateness (is it perceived as fitting or relevant?), feasibility (can it be successfully implemented?), and sustainability (can it be maintained over time?). These implementation outcomes help assess the practical effectiveness of Islamic adaptations in real-world settings.

Together, these frameworks provide a comprehensive theoretical foundation for understanding both the mechanisms through which Islamic practices are integrated into PM+ and the practical outcomes of these adaptations. This dual framework approach allows us to examine how specific religious tailoring strategies (Reframing, Reprioritizing, Reforming) influence implementation outcomes (acceptability, appropriateness, feasibility, sustainability) to enhance the overall effectiveness of PM+ for Somali Muslim women.

Culture shapes mental health through multiple pathways. First, culture influences how distress is experienced and expressed, with Somali communities often manifesting psychological suffering through somatic complaints rather than emotional language (Kuittinen et al., 2017). Second, culture determines what constitutes "normal" versus "abnormal" behaviors and emotions, as evidenced by the distinct Somali categories of mental wellbeing (Caafimaad, Waalli, and Wallida Khafiifka ah) that differ markedly from Western diagnostic classifications (Mohamed, 2018). Third, culture guides help-seeking pathways, with

Somali refugees typically turning to religious leaders and family networks before professional mental health services (Michlig et al., 2022).

For Somali Muslim women, mental health must be understood at the intersection of cultural identity and religious faith. Somali culture's collectivist orientation places emphasis on family cohesion, community reputation, and intergenerational harmony (Lincoln et al., 2021). These values can simultaneously serve as sources of resilience and potential barriers to accessing formalized care. Additionally, Islamic spiritual frameworks provide meaning-making mechanisms through which many Somali women interpret their psychological experiences. Religious concepts such as sabr (patience), tawakkul (reliance on Allah), and dua (supplication) function as important coping resources (Keshavarzi & Haque, 2013).

The combined theoretical framework underscores the necessity of developing interventions that acknowledge and incorporate these cultural and religious dimensions. Without such cultural adaptation, evidence-based mental health interventions risk misalignment with the lived experiences and healing paradigms of Somali Muslim women.

Description of Somali Refugees in King County

Seattle's metropolitan area hosts the third-largest Somali community in the United States, with approximately 30,000 Somali residents in King County (Mohamed, 2018). This community has experienced multiple waves of migration, first in the 1960s seeking educational and employment opportunities, and then in the 1990s fleeing civil war (Mohamed, 2018). Many continue to face complex challenges related to mental health and wellbeing as they navigate resettlement.

The Somali community in King County exhibits distinctive cultural and social characteristics relevant to mental health service implementation. Mohamed (2018) found that the community largely views mental health through a traditional lens that differs significantly from Western biomedical frameworks. Many community members rely on religious institutions and leaders for guidance on mental health concerns, with mosques serving as primary sources of support. The communal nature of Somali culture means that mental health concerns often affect entire families and communities, not just individuals. While existing mental health resources in King County include general healthcare providers, specialized mental health services, and community organizations, many of these lack cultural and linguistic appropriateness for Somali populations (Mohamed, 2018).

Migration and Acculturation Stress

The migration process presents multiple factors affecting mental wellbeing through three distinct phases: pre-migration, migration, and post-migration resettlement (Kirmayer et al., 2011). During pre-migration, many experience trauma and loss of social support. During migration, refugees may live in harsh conditions, face violence, and experience uncertainty. In post-migration, many feel loss of social status, unemployment, difficult acculturation, and discrimination.

Mohamed (2018) found that Somali participants in King County identified trauma from the civil war in Somalia and challenges in their host country—including unemployment, discrimination, harassment, and unaddressed basic needs—as significant contributors to mental health conditions. As one key informant explained, "In our community mental health is a big issue because of the circumstance we lived through...our community destroyed each other...we went through a lot of hardship at refugee camps, we went through unimaginable atrocities among ourselves and...the new land that we came into the United States was not an easy transition" (Mohamed, 2018, p. 9).

Betancourt et al. (2015) examined how resource loss and acculturative stress affected caregiver-child relationships in Somali refugee families, finding that these stressors significantly impacted family functioning. Lincoln et al. (2021) identified discrimination and marginalization as key factors affecting mental health among Somali immigrants in North America, while also noting that a sense of belonging could serve as a protective factor. These multiple stressors create a complex picture of mental health vulnerability that requires culturally responsive interventions.

Barriers to Mental Health Care

Numerous structural barriers prevent Somali women from accessing appropriate mental health services. Mohamed (2018) identified barriers at individual, community/family, and structural levels. At the structural level, these included lack of culturally appropriate services, fear of negative consequences (such as having children taken away), absence of a central community hub, and costs and physical distance of mental health facilities.

Said et al. (2021) documented additional barriers among Somali-Australian women including lack of culturally appropriate services, language barriers, and limited mental health literacy. Pavlish et al. (2010) found that Somali immigrant women often experience discordant beliefs and divergent expectations when interacting with the American healthcare system, creating significant obstacles to receiving effective care.

Somali communities often conceptualize mental health differently from Western biomedical models. Mohamed (2018) found that many Somali residents in King County described mental wellbeing in three distinct categories: Caafimaad (Well), Waalli (crazy), and Wallida Khafiifka ah ("soft crazy"). Those in the "Well" category were described as "functioning in society and able to take care of themselves/others," while those with "Waalli" were seen as individuals who had "lost their mind" or were "disconnected from reality." The intermediate category, "Wallida Khafiifka ah," described individuals showing early symptoms of mental illness but still functioning in society.

Many Somali people view mental health through a lens that integrates spiritual explanations, attributing conditions to jinn (spiritual possession), sixir (black magic), il (evil eye), weak iimaan (faith), and trauma (Mohamed, 2018). Gonzalez et al. (2024) found that mental health issues were often attributed to excessive assimilation into "modern" Western life, creating additional barriers to seeking care. These cultural conceptualizations lead to help-seeking pathways that differ from Western norms, with Somali communities primarily seeking religious healing practices as their first response to mental health challenges, turning to mosques and imams before pursuing other options (Mohamed, 2018).

At the community level, stigma and fear of gossip present significant barriers, with one woman in Mohamed's (2018) study noting, "When we hear our neighbor is struggling, instead of helping them we call 8 people to talk about them" (p. 16). These cultural beliefs and practices necessitate mental health interventions that can bridge Western and Somali understandings of mental health and integrate culturally relevant healing approaches.

Evidence-Based Interventions and Problem Management Plus (PM+)

Several evidence-based interventions have shown promise for addressing mental health needs in refugee populations. Problem Management Plus (PM+) in particular has emerged as an effective intervention for addressing psychological distress in underserved populations exposed to adversity (World Health Organization, 2016).

PM+ is a brief, transdiagnostic psychological intervention developed by WHO that consists of five weekly sessions delivered by trained non-specialists. The intervention includes components on stress management, problem-solving, behavioral activation, and strengthening social support. De Graaff et al. (2024) found that PM+ is effective in reducing psychological distress and symptoms of anxiety over a period up to 1 year among Syrian refugees in high-income countries. The PM+ approach is especially promising because it can be delivered by "peer-refugees" or other non-specialists, making it potentially more accessible and culturally appropriate for refugee communities.

Other approaches have also shown promise for refugee populations. Purgato et al. (2023) conducted the RESPOND randomized controlled trial evaluating a stepped-care program of WHO psychological interventions in migrant populations, combining multiple interventions delivered in a stepped-care format. Robertson et al. (2019) evaluated a Health Realization Community Coping Intervention specifically for Somali refugee women, while Pratt et al. (2017) found that group cognitive behavioral therapy led by community health workers showed promise for Somali immigrants.

Importance of Islamic Integration in Mental Health Interventions

Islamic perspectives on mental health offer rich resources for intervention adaptation. Traditional Islamic concepts such as sabr (patience), tawakkul (trust in God), and dua (supplication) have been identified as important coping mechanisms among Muslim populations (Keshavarzi & Haque, 2013). Recent studies have begun to explore the integration of these principles into evidence-based psychological treatments, with promising preliminary results (Hamdan, 2008).

Religious leaders in Mohamed's (2018) study acknowledged their trusted position in the Somali community, with one stating, "We are the first response for mental health treatment, we have the community trust" (p. 13). Notably, many religious leaders encouraged a complementary approach combining religious healing with Western medicine, stating that "Quran does not reject or contradict to seek medical treatments, rather it is encouraging this" (Mohamed, 2018, p. 15). This openness to integrative approaches suggests potential for interventions that bridge Islamic and Western psychological perspectives.

The integration of Islamic principles represents a promising approach to increasing the cultural appropriateness and effectiveness of evidence-based interventions for Somali Muslim women. By examining participant feedback on the perceived acceptability of Islamic problem-solving and stress management techniques within PM+, this research can help bridge the gap between Western clinical approaches and culturally meaningful healing practices for Somali Muslim women.

Methods

Study Setting

This study was conducted in King County, Washington, with participants recruited through Neighborhood House, a community action agency serving immigrant and refugee populations since 1906. Neighborhood House partnered with Somali stakeholders and the University of Washington to address challenges in connecting clients to culturally responsive behavioral health care. This partnership aimed to support Somali communities through the implementation of culturally adapted psychological interventions (Mohamed, 2018).

The research was intentionally situated within existing community structures to enhance accessibility and cultural relevance. Neighborhood House's established presence in the community provided a familiar and

trusted environment for participants, an important consideration given cultural sensitivities around mental health discussions.

Selection of Study Subjects

Source

This study was conducted as part of a larger community-based research project examining culturally adapted mental health interventions for the Somali community. From the 14 total participants in the broader study (10 women, 4 men), this thesis focuses specifically on the 10 Somali Muslim women who participated in the Islamic-adapted PM+ sessions.

Participants were recruited through Neighborhood House clientele and from various Somali support groups and community organizations across King County. Recruitment leveraged established relationships with the community, as well as partnerships with local mosques, community centers, and social service organizations serving Somali women.

Key recruitment partners included Somali Resource Specialists at Neighborhood House who served as cultural brokers facilitating access to the community. Local imams and religious leaders also facilitated access to potential participants, given their trusted position within the community (Mohamed, 2018).

Sampling Method and Recruitment

The study employed purposive sampling to recruit participants across three groups: recent immigrants (less than 5 years in the US), long-term immigrants (6 or more years in the US), and second-generation Somali American women. This approach aimed to capture diverse perspectives and ensure representation of different migration experiences and levels of acculturation.

This purposive sampling method was appropriate because it allowed for targeted recruitment of participants with specific experiences relevant to the research question. Cultural factors influencing this sampling decision included the importance of recognizing generational differences in mental health conceptualization (Mohamed, 2018).

Recruitment occurred through in-person outreach at community events, referrals from trusted community leaders, and through existing Neighborhood House programs.

Criteria for Eligibility and Exclusion

Participants were Somali Muslim women aged 18-75 residing in King County. The inclusion criteria specified that participants must self-identify as Somali and Muslim, be able to communicate in Somali and/or English, be willing to participate in sessions integrating Islamic practices, currently reside in King County, Washington, and have the ability to provide informed consent.

The study excluded individuals with severe mental health symptoms requiring more intensive intervention, such as active psychosis or high suicide risk, as well as those with cognitive impairments that would impede participation in the intervention. These criteria were designed to ensure that participants could meaningfully engage with the adapted PM+ intervention while also protecting those who may require more intensive mental health support.

Description of Intervention

The study implemented an adapted version of the Problem Management Plus (PM+) intervention that focused on integrating Islamic principles and practices into the standard protocol, particularly in relation to problem-solving and stress management components. The adaptation process involved collaboration with Somali community members, religious leaders, and mental health professionals to ensure cultural authenticity and religious appropriateness.

The intervention integrated several specific Islamic practices using the 3R Model strategies. For Reframing, stress was presented within Islamic frameworks of tests from Allah and opportunities for spiritual growth. For Reprioritizing, religious practices like du'as (supplications) and dhikr (remembrance) were integrated with breathing exercises to align stress management with valued religious activities. For Reforming, misconceptions about the compatibility of Islamic practice with psychological techniques were addressed through religious validation.

Four specific Islamic adaptation types were incorporated:

1. **Religious Practice Integration**: adaptation of breathing exercises to incorporate du'as or dhikr
2. **Religious Narrative Application**: use of Prophet Muhammad stories to illustrate problem-solving approaches
3. **Islamic Conceptual Frameworks**: integration of concepts like tawakkul (reliance on God) and sabr (patience) for emotional resilience
4. **Islamic Daily Structure**: alignment of PM+ activities with Islamic daily practices and routines

Sessions were delivered by Somali Resource Specialists at Neighborhood House who had been trained in the adapted PM+ intervention. Each participant attended a single session approximately 60-90 minutes in duration and conducted in Somali for those who did not speak English to ensure linguistic and cultural appropriateness. Before beginning the intervention, participants completed a religiosity assessment that was later used for evaluation and analysis purposes. The adaptation was developed through a collaborative process that included pilot testing of adapted materials with Somali women and refinement based on feedback from pilot participants. This integrated approach aimed to create an intervention that was both evidence-based and culturally meaningful for Somali Muslim women (Mohamed, 2018).

Data Collection

Sources

Data collection employed a sequential mixed methods approach. Initial qualitative data was collected through semi-structured interviews with 10 participants who completed the adapted PM+ intervention. These interviews explored participants' experiences with the Islamic adaptations, including their perceptions of each adaptation type (religious practice integration, religious narrative application, Islamic conceptual frameworks, and Islamic daily structure).

Following qualitative data collection and preliminary analysis, a quantitative survey was developed with seven Likert-scale items measuring the perceived acceptability of specific Islamic adaptations within PM+:

1. "The Islamic stress management techniques we practiced were helpful"
2. "I felt comfortable using duas or dhikr as a breathing exercise"
3. "Combining Islamic practices with PM+ made the strategies more meaningful to me"

4. "The Islamic practices we learned fit well with my existing religious practices"
5. "Learning about how the Prophet (PBUH) handled challenges was relevant to my situation"
6. "Combining duas or dhikr with breathing exercises helped me feel calmer"
7. "I found it natural to use duas or dhikr while practicing the breathing techniques"

Response categories included: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree. The survey was administered to all the interview participants to quantify acceptability ratings and enable systematic comparison across adaptation types and demographic factors. Survey sessions were conducted in participants' preferred language, primarily Somali, with trained bilingual research staff.

All instruments underwent cultural validation through translation and back-translation between English and Somali, with review by bilingual Somali community members. Standardized measures were adapted to ensure cultural relevance, with particular attention to concepts that may not translate directly between languages (Mohamed, 2018).

Protocol for Typical Subject

The data collection protocol for each participant followed a structured sequence. First, an informed consent process was conducted in Somali by a Somali-speaking researcher. Next, a pre-intervention assessment of mental health concepts, religiosity, and current coping strategies was completed. Participants then engaged in adapted PM+ sessions lasting approximately 60-90 minutes each. Post-session feedback was collected after each session. Finally, a comprehensive interview was conducted following completion of the intervention.

Sessions were conducted at locations convenient for participants, including Neighborhood House facilities or other community spaces familiar to Somali women and virtually. Cultural considerations in data collection included gender matching of researchers and participants, scheduling around prayer times, and attention to cultural norms around privacy and disclosure.

Participants had the option to opt in or out of audio recordings during data collection. For those who declined recording, extensive notetaking was employed during and after sessions.

Several measures were implemented to ensure data quality. Research team members were trained in culturally sensitive data collection techniques. Translations were verified through back-translation procedures. Detailed field notes were maintained for participants who declined recording. Multiple coders were used for qualitative data to enhance reliability. Individual review with participants was conducted to verify accuracy of key findings.

These measures aligned with established community-based participatory research approaches, emphasizing collaborative partnerships and co-learning (Israel et al., 2005).

Analysis Plan

Analysis followed a sequential mixed methods integration approach, beginning with qualitative analysis to identify key themes, followed by quantitative analysis to measure their prevalence and distribution.

For qualitative data, thematic analysis was conducted using the 3R Model and Implementation Outcomes Framework as coding schemas with detailed operational definitions provided in Appendix D. Interview transcripts were coded to identify instances of the three 3R strategies (Reframing, Reprioritizing,

Reforming) and four implementation outcomes (acceptability, appropriateness, feasibility, sustainability). Additionally, codes were applied to identify the four adaptation types (religious practice integration, religious narrative application, Islamic conceptual frameworks, and Islamic daily structure).

Quantitative analysis of survey data included:

1. Descriptive statistics for each of the seven Islamic adaptation items
2. Thematic grouping analysis by organizing related items:
    - Religious Practice Integration (items 2, 6, 7): Comfort and effectiveness of combining du'as with breathing
    - Religious Narrative Application (item 5): Relevance of Prophet stories
    - Islamic Conceptual Frameworks (items 1, 3, 4): Overall helpfulness and meaningfulness of Islamic integration

Given the small sample size (n=10), analysis focused on descriptive statistics rather than inferential testing. Patterns identified in the quantitative data are presented as exploratory findings and interpreted in conjunction with the qualitative data.

Integration of qualitative and quantitative data was accomplished through joint displays and discussion—tables that present quantitative ratings alongside illustrative quotes for each theme and implementation outcome, organized according to the 3R Model strategies and adaptation types. This integration approach enabled triangulation between data sources and comprehensive assessment of acceptability across multiple dimensions.

Results

This section presents findings organized to maintain consistency between the study's sequential exploratory design, beginning with qualitative themes followed by quantitative validation of key patterns.

Characteristics of Study Sample

The sample included ten Somali Muslim women with a response rate of 100% (10/10 participants who began the study completed all components). Participants represented three generational cohorts: older immigrants who migrated as adults (ages 54-75, n=6), younger immigrants who migrated as children or adolescents (ages 18-31, n=3), and one second-generation participant born in the US (age 22). Geographic concentration was high, with seven participants residing in South Seattle (98108).

All participants demonstrated high religiosity, rating Islam as very important in their lives and praying five times daily. This religious homogeneity was essential for evaluating Islamic adaptations, as the sample provided perspectives across different acculturation experiences while maintaining the cultural and religious consistency needed to assess acceptability of Islamic integration within PM+.

Quantitative Findings: Survey Results on Islamic Adaptation Acceptability

The quantitative survey results strongly validated the qualitative themes, with consistently high acceptance across all measures. Table 1 presents the complete frequency distribution of participant responses across all seven survey items measuring acceptability of Islamic adaptations to PM+.

Table 1: Survey Response Frequencies - Islamic Adaptation Acceptability (N=10)

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Islamic stress management techniques were helpful*	**6**	**3**	0	0	0
2. Comfortable using du'as/dhikr with breathing	**9**	**1**	0	0	0
3. Combining Islamic practices made strategies more meaningful	**9**	**1**	0	0	0
4. Islamic practices fit with existing religious practices	**9**	**1**	0	0	0
5. Prophet stories relevant to my situation	**8**	**2**	0	0	0
6. Du'as/dhikr with breathing helped me feel calmer	**9**	**1**	0	0	0
7. Natural to use du'as/dhikr with breathing techniques	**7**	**2**	**1**	0	0

**Note: Item 1 has one missing response (n=9)*

Overall Acceptability Pattern: Participants demonstrated consistently high acceptance across all measures. The response patterns showed strong clustering in the positive categories, with 90-100% of participants agreeing or strongly agreeing with acceptability items. The most unanimous agreement was on items related to combining Islamic practices with PM+ techniques (items 2, 3, 4, 6), where 100% of participants responded positively. Item 7 showed the most variation, with one participant responding neutrally to the naturalness of using du'as with breathing techniques, though 90% still responded positively. When analyzed by the thematic groups described in the analysis plan, all adaptation types received strong endorsement: Religious Practice Integration items (90-100% positive), Religious Narrative Application (100% positive), and Islamic Conceptual Frameworks (100% positive across all items).

Qualitative Findings: Three Main Themes

Analysis of interview data revealed three distinct themes explaining how participants experienced the Islamic adaptations to PM+.

Theme 1: Religious Familiarity and Recognition - "This is Something I Could Do"
Participants experienced immediate cultural recognition when Islamic elements were integrated into PM+ techniques. Religious framing made unfamiliar therapeutic techniques accessible and personally relevant. As one participant explained:

"As a Muslim, if someone were to tell me about breathing, managing problems...once you add the prophet (PBUH), it becomes like, 'oh this is something that I could do'" (P13).

The integration with existing daily religious practices was particularly important for creating this sense of familiarity: *"This is something I do everyday, we say alhamdulliah, subhanAllah"* (P4). One participant captured the overall experience of cultural recognition:

"I felt seen. I felt heard. It was very relatable. I liked the fact that it was well thought-out. 'Somali? Muslim? Hey, you already got me'" (P14).

This theme reflects how Islamic adaptations created an immediate sense of cultural safety and belonging that facilitated engagement with therapeutic techniques that might otherwise feel foreign or inappropriate.

Theme 2: Integration of Religious Coping with PM+ Techniques - "Powerful Combinations"
Participants consistently described how Islamic practices enhanced rather than replaced evidence-based PM+ techniques, creating synergistic effects they characterized as more powerful than either approach alone. This integration manifested across three specific domains:

Combining breathing with du'as for enhanced stress management: Participants found that the combination of physical and spiritual elements created comprehensive healing effects. As one participant explained:

"They both helped in their both ways. Duas they provide a sense of spiritual grounding that brings peace and comfort... When you pair that with the deep breathing exercises it helps me feel physically calm. The duas sooth my heart and mind. Together they create a powerful combination...they feel both emotionally and physically healing" (P12).

Prophet stories as models for problem-solving: Using narratives from Prophet Muhammad's (PBUH) life provided both practical frameworks and emotional support for problem-solving. One participant noted:

"It made me see how the prophet was breaking down problems for himself. This is more evidence that we can always overcome problems with logic and with faith. These steps are the logic part because they show how you can make it easy to breakdown and work through" (P6).

Islamic concepts providing frameworks for understanding stress: Concepts like tawakkul (reliance on Allah) and sabr (patience) offered new ways to understand and cope with stress that reduced self-blame and increased resilience. As one participant described:

"Being God aware makes you realize that you're weak. It takes away from blaming yourself. There's a greater being who is in control of your problem. Realizing, especially with iman, accepting the good and bad takes away that burden. You just give it back to Allah. You learn to deal with what is in your control and leave the rest to Him" (P13).

Theme 3: Community Acceptability and Dissemination Potential - "Starting with My Mother Tonight"
While participants expressed high personal acceptability, they also identified important considerations for broader community implementation. This theme revealed both opportunities and barriers for scaling the Islamic adaptations beyond individual use.

Participants identified several practical barriers that would need to be addressed for community-wide implementation, including literacy limitations and cultural preferences for oral rather than written communication:

"The calendar might not be useful for someone who doesn't read or write. Make it more simple" (P1). Cultural approaches to planning and organization also presented challenges: *"We do things by hadal (talk). It's never something that's organized or written"* (P11).

Despite these barriers, participants expressed strong intentions to share the techniques with family members and suggested community-based delivery approaches. One participant immediately planned to begin teaching:

> *"100%. Hooyaan caawa ku bilaabaya [I'm starting with my mother tonight]"* (P11).

Others recommended group-based implementation:

> *"Group setting instead... Group 1 learns, then maybe teaches others"* (P1).

Integrated Analysis: Implementation Outcomes and 3R Strategies

The qualitative themes were systematically analyzed according to the study's theoretical frameworks to understand the mechanisms and outcomes of Islamic integration. Table 2 presents the frequency distribution of coded qualitative instances, created by systematically coding each participant statement for both its 3R strategy type and implementation outcome focus.

Table 2: Implementation Outcomes by 3R Strategy Distribution

Implementation Outcome	Reprioritizing	Reframing	Reforming	Total Instances
Acceptability	36 (61%)	20 (34%)	3 (5%)	59
Appropriateness	44 (73%)	8 (13%)	8 (13%)	60
Feasibility	17 (32%)	32 (60%)	4 (8%)	53
Sustainability	15 (88%)	1 (6%)	1 (6%)	17
Total Codes	**112 (59%)**	**61 (32%)**	**16 (8%)**	**189**

Note: Percentages represent distribution within each implementation outcome

Acceptability was primarily achieved through Reprioritizing strategies (61% of codes), as Islamic elements made PM+ techniques feel personally satisfying and culturally familiar. Survey results showed 9/10 participants strongly agreed with acceptability items, with qualitative data revealing that participants found the adaptations emotionally resonant:

> *"I felt seen. I felt heard. It was very relatable"* (P14).

Appropriateness received the strongest endorsement, with 10/10 participants agreeing or strongly agreeing with appropriateness items. This outcome was most strongly associated with Reprioritizing (73% of codes), indicating that Islamic adaptations worked best when they aligned with existing religious values rather than challenging them. Participants described strong cultural fit:

> *"This is the religion. It is very relevant, and this is something that is key to our religion"* (P3).

Feasibility showed more variation, with 9/10 participants responding positively but qualitative data revealing both enablers and barriers. While survey ratings were positive, participants identified practical challenges including literacy limitations and cultural preferences for oral communication that would need to be addressed for broader implementation.

Sustainability was evidenced through strong intentions to continue personal use and teach family members, with 88% of sustainability codes associated with Reprioritizing strategies. Participants expressed confidence in long-term use:

"Yes, I will continue to practice and use these strategies" (P5), and immediate intentions to share: *"I'm starting with my mother tonight"* (P11).

Islamic Conceptual Frameworks received the highest appropriateness ratings (10/10 participants positive) and were most strongly associated with Reprioritizing strategies (73% of appropriateness codes). These adaptations worked by helping participants understand stress management within existing Islamic worldviews rather than requiring new belief systems.

Religious Practice Integration (combining du'as with breathing) received strong ratings (10/10 participants positive) and also operated primarily through Reprioritizing, as participants could incorporate familiar daily religious practices into therapeutic techniques.

Religious Narrative Application (Prophet stories) received high ratings (10/10 participants positive) and showed more balance between Reprioritizing and Reframing strategies, providing both familiar religious content and new ways of understanding problem-solving approaches.

The integration of qualitative and quantitative findings is systematically presented in Table 3, which shows the convergence between qualitative themes and quantitative survey responses, with integration assessment categories indicating the relationship between data sources.

Table 3: Joint Display - Integration of Quantitative and Qualitative Findings

Qualitative Theme	Survey Items	Quantitative Results	Integration Assessment	Representative Quote
Theme 1: Religious Familiarity and Recognition	Items 2, 4, 7: Comfortable using du'as with breathing; Practices fit with existing religious practices; Natural to use du'as with breathing	10/10, 10/10, and 9/10 participants agreed/strongly agreed	**CONFIRMATION**	*"I felt seen. I felt heard... 'Somali? Muslim? Hey, you already got me'"* (P14)

Theme 2: Integration of Religious Coping	Items 1,3,5,6: Islamic stress management helpful; Combining practices made strategies meaningful; Prophet stories relevant to situation; Du'as with breathing helped feel calmer	9/10, 10/10, 10/10, and 10/10 participants agreed/strongly agreed	**CONFIRMATION**	*"Together they create a powerful combination...emotionally and physically healing"* (P12)
Theme 3: Community Acceptability and Dissemination Potential	No direct survey measurement	N/A - Qualitative theme only	**EXPANSION**	*"I'm starting with my mother tonight"* (P11)

Integration Assessment: The quantitative ratings strongly confirm the qualitative themes, with high numerical agreement supporting the rich experiential descriptions participants provided. The qualitative data expands understanding beyond what could be measured quantitatively, particularly regarding community implementation pathways and the mechanisms through which Islamic integration enhanced therapeutic engagement.

Discussion

Summary of Key Findings

This study examined the acceptability of Islamic problem-solving and stress management techniques integrated into adapted Problem Management Plus (PM+) among Somali Muslim women in King County. The findings provide compelling evidence that thoughtful integration of Islamic practices significantly enhances the acceptability of evidence-based mental health interventions for this population.

Quantitative results demonstrated consistently high acceptability across all measures, with 90-100% of participants agreeing or strongly agreeing with acceptability items. Three qualitative themes emerged that explain how Islamic adaptations created immediate cultural recognition, enhanced therapeutic effectiveness through synergistic combinations, and generated strong motivation for community dissemination. The dominance of Reprioritizing strategies (59% of coded instances) revealed that the most successful adaptations worked by aligning evidence-based techniques with already-valued religious practices rather than requiring fundamental belief changes.

The enhancement model that emerged from this research represents a significant departure from traditional cultural adaptation approaches. Rather than substituting or modifying Western content, participants consistently described Islamic adaptations as creating "powerful combinations" that amplified the effectiveness of PM+ techniques. This finding has important implications for understanding cultural

barriers to mental health care, suggesting they may stem more from lack of recognition of existing compatibilities than from fundamental incompatibilities between Western and Islamic approaches.

Study Strengths and Limitations

Study Strengths

This research demonstrates several important strengths that enhance the validity and contribution of findings. The sequential mixed-methods design enabled triangulation of quantitative and qualitative data, with high agreement between numerical ratings and qualitative themes providing strong evidence for validity. The sample size of 10 participants was appropriate for exploratory research examining acceptability of novel cultural adaptations, allowing in-depth examination while identifying clear patterns across Islamic adaptations.

The integration of multiple theoretical frameworks—the 3R Model and Implementation Outcomes Framework—provided a comprehensive analytical approach that extends beyond simple satisfaction measures. This multi-framework approach represents a novel contribution to cultural adaptation research and offers a replicable model for future studies. The community-based participatory approach, conducted in partnership with Neighborhood House and Somali community members, ensured cultural authenticity and relevance of adaptations while building trust with participants.

The systematic application of implementation science frameworks to cultural adaptation addresses an important gap in the literature, where most adaptation studies focus primarily on cultural appropriateness without assessing practical implementation outcomes. The detailed operational definitions for coding 3R strategies and implementation outcomes enhance the replicability of the analytical approach.

Study Limitations

Several limitations should be considered when interpreting these findings. The small sample size (n=10) limits generalizability and prevents statistical analysis of relationships between demographic variables and acceptability outcomes. While the sample was sufficient for identifying clear patterns, larger studies would be needed to examine how factors such as age, education, or years in the US might influence responses to Islamic adaptations.

The single geographic location (King County, Washington) limits transferability to other Somali communities that may have different characteristics, resources, or relationships with local service systems. Somali communities in other regions may have varying levels of religious practice, different migration histories, or different cultural dynamics that could influence acceptability of Islamic adaptations.

The study design limitations include the lack of a control group, preventing direct comparison of Islamic-adapted PM+ with standard PM+ implementation. This limits conclusions about whether the high acceptability reflects the Islamic adaptations specifically or PM+ more generally. The cross-sectional assessment of acceptability cannot capture how perceptions might change over time or with extended use of techniques. The single-session format, while appropriate for acceptability assessment, does not reflect the multi-session structure of standard PM+ implementation.

Cultural and linguistic factors present additional limitations. Despite careful translation procedures, some Islamic concepts may not translate precisely between Somali and English, potentially affecting interpretation of findings. The high religiosity of all participants (rating Islam as very important and

praying five times daily) limits understanding of how Islamic adaptations might be received by less religious community members. Potential social desirability bias may have influenced responses, particularly given cultural sensitivity around mental health topics and the community-based setting of data collection.

How Key Findings Compare with Previous Work

Enhancement Rather Than Replacement Model

A novel finding was that Islamic adaptations enhanced rather than replaced PM+ techniques, creating effects that participants described as "emotionally and physically healing." This challenges common assumptions in cultural adaptation literature that modifications primarily involve substituting culturally appropriate content for Western approaches (Barrera & Castro, 2006). Instead, our findings suggest that religious practices can amplify the acceptability and potentially the effectiveness of evidence-based techniques when integrated thoughtfully.

This enhancement approach contrasts with previous adaptation studies that have focused primarily on cultural substitution or surface-level modification strategies. While previous PM+ adaptations have emphasized cultural tailoring of content and delivery methods (de Graaff et al., 2024), this study demonstrates how religious practices can synergistically combine with evidence-based techniques to create new therapeutic possibilities that participants find more compelling than either approach alone.

Religious Familiarity as Cultural Bridge

The finding that religious familiarity was critical to intervention acceptability extends existing literature on cultural adaptation for refugee populations. While previous studies have noted the importance of cultural tailoring (Hwang et al., 2008), this research shows how specific religious elements can serve as immediate cultural bridges that transform participant perceptions of evidence-based interventions from the first encounter.

This finding aligns with Mohamed's (2018) work showing that Somali communities primarily rely on religious frameworks for understanding mental health, but extends this work by demonstrating empirically how religious familiarity can be leveraged to increase acceptance of Western psychological interventions. The immediate cultural recognition participants expressed suggests that Islamic integration addresses barriers at a deeper level than surface cultural modifications.

3R Model Application to Mental Health Interventions

The finding that Reprioritizing strategies appeared most frequently across themes (59% of codes) while Reforming strategies were rarely identified (8% of codes) extends Padela et al.'s (2018) 3R Model from health behaviors to mental health interventions. This study provides the first empirical application of the 3R Model to psychological interventions and demonstrates distinct effectiveness patterns across the three strategies.

The limited use of Reforming strategies was unexpected given documented misconceptions about Islam and mental health in some Muslim communities (Gonzalez et al., 2024). However, this finding may reflect the specific characteristics of our sample—women already engaged with community services who may have fewer misconceptions requiring correction. Alternatively, it may suggest that the most effective religious adaptations work by building on existing correct beliefs rather than correcting misconceptions.

Implications of Findings

For Theory and Conceptual Models

This study's findings challenge fundamental assumptions about cultural adaptation in mental health interventions and suggest new directions for theoretical development. The discovery that Islamic practices can enhance rather than replace evidence-based techniques indicates that we may have been approaching cultural integration with an unnecessarily limited either-or framework. The enhancement model that emerged suggests cultural and evidence-based approaches can create synergistic effects that are more powerful than either approach alone.

The enhancement model extends both the 3R Model and Cultural Influences on Mental Health framework by demonstrating that religious practices can amplify rather than simply accommodate evidence-based interventions. This has important implications for how we conceptualize the relationship between culture and evidence-based practice, moving from a framework of potential conflict to one of potential synergy.

The finding that Reprioritizing strategies were most effective suggests that successful religious adaptations work less by correcting misconceptions and more by revealing existing alignment between religious values and therapeutic goals. This challenges deficit-based approaches to cultural adaptation that focus primarily on overcoming barriers, suggesting instead that adaptation should focus on building upon existing cultural strengths and compatibilities.

For Public Health Practitioners and Clinicians

For practitioners working in diverse communities, this research offers both encouragement and practical guidance for implementing culturally responsive interventions. The immediate cultural recognition participants expressed demonstrates how thoughtful religious integration can transform the therapeutic relationship from the outset, moving from potential mistrust to authentic engagement. This suggests that practitioners need not view religious beliefs as obstacles to overcome but as resources to leverage.

The specific adaptations tested provide concrete strategies practitioners can implement: incorporating familiar religious practices into evidence-based techniques (du'as with breathing), using respected religious figures as models for therapeutic approaches (Prophet stories), and framing mental health concepts within existing spiritual frameworks (tawakkul and sabr). These adaptations don't require practitioners to become religious experts but rather to become skilled at recognizing and building upon the religious resources their clients already possess.

The study's findings address a common concern among evidence-based practice advocates that cultural adaptations might dilute therapeutic effectiveness. Instead, participants' experiences suggest that Islamic integration strengthened rather than compromised the interventions, giving practitioners confidence to pursue religious integration when working with Muslim clients while maintaining therapeutic integrity. The enhancement model suggests that cultural responsiveness and evidence-based practice can be mutually reinforcing rather than competing priorities.

The participants' strong intentions to teach these techniques to family members points to an often-overlooked implementation opportunity. When interventions align authentically with cultural values, they naturally become part of community knowledge-sharing networks, suggesting practitioners might systematically prepare clients to become peer educators within their own communities.

For Future Research

The promising results of this exploratory study create an important research agenda with significant potential for advancing culturally responsive mental health care. The high acceptability demonstrated here provides strong justification for larger-scale effectiveness trials that should examine whether the synergistic effects observed translate to improved clinical outcomes and sustained behavior change.

Randomized controlled trials comparing enhancement-model adaptations with both standard interventions and traditional cultural adaptation approaches would provide crucial evidence about the relative effectiveness of different adaptation strategies. These studies should examine not only clinical outcomes but also engagement, retention, and long-term sustainability to understand the full impact of the enhancement approach.

Implementation science studies examining how enhancement-model adaptations perform in real-world service delivery contexts would address critical questions about training requirements, supervision needs, and organizational factors that support or hinder implementation. Understanding how to prepare practitioners to effectively integrate religious elements while maintaining therapeutic integrity will be essential for scaling successful adaptations beyond research settings.

Methodological research developing validated measures of religious integration quality would significantly advance the field. Currently, we lack standardized ways to assess how well interventions achieve authentic religious integration versus superficial cultural accommodation. Such measures would support both intervention development and quality improvement efforts across different cultural adaptation initiatives.

The applicability of enhancement-focused adaptation to other cultural and religious groups represents another important research frontier. While this study focused specifically on Somali Muslim women, the underlying principle that cultural practices can amplify rather than compromise evidence-based interventions may have broader relevance. Studies with other Muslim populations, as well as other religious and cultural groups, would help establish the generalizability of the enhancement model.

Longitudinal research examining the sustainability of both acceptability and therapeutic effects over time would address important questions about whether initial enthusiasm for culturally adapted interventions translates to sustained engagement and lasting benefit. Long-term follow-up studies would also help identify factors that support or hinder continued use of culturally integrated techniques.

Finally, economic evaluations examining the cost-effectiveness of enhancement-model adaptations would provide essential information for policy makers and healthcare systems considering investment in culturally adapted interventions. Understanding both the costs and benefits of religious integration would support evidence-based decisions about resource allocation and program development.

Conclusion

The high acceptability ratings (90-100% agreement across implementation outcomes) and consistent qualitative endorsements demonstrate that Islamic adaptations created immediate cultural recognition and enhanced therapeutic engagement. Participants consistently described these adaptations as creating "powerful combinations" that amplified rather than replaced the effectiveness of PM+ techniques. This enhancement model represents a significant departure from traditional cultural adaptation approaches that focus primarily on substitution or surface-level modification of Western content.

The dominance of Reprioritizing strategies (59% of coded instances) reveals that the most successful adaptations worked by aligning evidence-based techniques with already-valued religious practices rather

than requiring fundamental belief changes. This finding has important implications for understanding cultural barriers to mental health care, suggesting they may stem more from lack of recognition of existing compatibilities than from fundamental incompatibilities between Western and Islamic approaches to healing.

The strong intentions participants expressed to teach these techniques to family members and their recommendations for community-based implementation highlight the potential for natural dissemination through community networks when interventions authentically honor cultural and religious values. This organic expansion could significantly extend the reach and impact of culturally adapted interventions beyond formal service delivery systems.

These findings contribute to growing evidence that culturally responsive mental health care need not compromise therapeutic effectiveness. Instead, when religious and cultural practices are thoughtfully integrated with evidence-based techniques, they can create synergistic effects that enhance both acceptability and potentially therapeutic outcomes. For Somali Muslim women and other refugee communities facing significant mental health challenges while navigating cultural barriers to care, this enhancement approach offers a promising pathway toward more equitable and effective mental health services.

The implications extend beyond this specific population to broader questions about how public health approaches cultural diversity. By demonstrating that cultural practices can amplify rather than dilute evidence-based approaches, this research supports a more nuanced and respectful approach to serving diverse communities—one that builds upon existing cultural strengths rather than viewing them as obstacles to overcome. This represents an important shift toward truly collaborative models of culturally responsive care that honor both scientific rigor and cultural authenticity.

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This research represents not just an academic endeavor, but a step toward more equitable and culturally meaningful mental health care. I am honored to have been part of this collaborative effort to bridge evidence-based practice with the rich cultural and spiritual traditions of my Somali Muslim community.

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Appendices

Appendix A: Interview Guide

Introduction Script

Demographic Questions

1. What is your age?	
2. What is your gender?	
3. For how many years have you lived in the US?	
4. What is your zip code?	
5. Are you a parent?	

Short Description of PM+, Managing Stress, and Managing Problems

Any comments the interviewee makes while thinking aloud.

1. Do you have any questions about PM+, Managing Stress and Managing Problems tools?

2. Any questions so far?

Managing Stress: Slow Breathing + Short Du'as or Dhikr?

Any comments the interviewee makes while thinking aloud.

Probes:

1. Tell me more about breathing and du'as- was this easy to do? Why or why not?

2. What else might you want to know before diving into Managing Stress exercises?

Managing Stress: Introduce the Heart Method

Any comments the interviewee makes while thinking aloud.

Probes (if needed / if the client doesn't offer their thoughts while thinking aloud)

1. I'm curious whether the HEART method feels relevant to you – why or why not?

Managing Problems overview (10 min)

Please describe what you are seeing and thinking out loud.

Questions

1. What else might you want to know before diving into the Managing Problems steps?

2. Tell me more about the problem-solving steps – do these seem easy to do? Why or why not?

3. What do you think about the questions listed in the Worksheet for Steps 1 – 6?

4. What do you think about the icons listed for Steps 1 - 6?

Managing Problems: Calendar (5 min)

Any comments the interviewee makes while thinking aloud.

Probes (if the client doesn't offer their thoughts while thinking aloud)

1. I'm curious what you thought about the calendar. What would make this easier to use for action planning? What would make this easier to understand? What might make this more engaging for the Somali community?

Managing Problems: Prophet Stories (5 min)

Any comments the interviewee makes while thinking aloud.

1. I'm curious what you thought about the prophet story I just shared. How did this make the problem-solving steps more usable? How did they not? What might make this more engaging for the Somali community?

2. What do you think about how the Prophet (SAW) solved this problem? How does this help you understand the PM+ steps? Would this story help others in our community understand how to solve problems?

Managing Problems & Stress outside sessions (5 min)

Any comments the interviewee makes while thinking aloud.

1. Tell me more about practicing these skills outside of our 1:1 sessions. How does this sound to you? What would make this easier to do?

2. I'm curious whether you might teach a family member or friend the Managing Stress or Managing Problems strategies. Why or why not?

Interview

These next questions are open-ended questions to hear your ideas on how to use PM+ tools with your community and to hear your thoughts about how useful using Islamic practices were in these adapted tools.

1. Let's revisit the materials: Is there anything you would add, remove, or change to make it easier to understand and use Managing Stress and Managing Problems?
2. Does it seem like these Managing Stress and Managing Problems strategies would be appropriate to help support you? Your family? Your friends? What would make them more comfortable?
3. Do you think that Somali community members would request Managing Stress and Managing Problems? Why / why not?
4. Do you think that Somali community members will do expected activities of Managing Stress and Managing Problems outside of the 1:1 sessions? Why/why not?
5. What would make Managing Stress and Managing Problems more relatable to engage someone from the Somali community? *Think about what other*

resources may be needed to support Somalis of different ages, genders, time living in the U.S., religiosity, etc.

Let's talk specifically about Islamic practices to support mental health (*Samira's thesis questions*)

Stress Management Experience

6. How helpful did you find using du'as as part of your stress management?
7. How helpful did you find the combination of du'as and deep breathing exercises as part of your stress management?
8. Have you used du'as or dhikr as a way to manage your stress before today?

Problem-Solving Experience

9. How often do you reference the stories of the Prophets when you are dealing with problems?
10. How did considering Islamic guidance affect your approach to handling problems?

Implementation

11. How comfortable are you practicing these Islamic coping strategies at home?
12. What made it easier or harder to use these Islamic practices for managing stress?
13. How did having Islamic practices included make you feel about the program?

Effectiveness

14. What aspects of the Islamic adaptations were most meaningful to you?
15. Would you continue using these Islamic coping strategies in the future?

Appendix B: Survey Instruments (English and Somali)

Religiosity Questionnaire

1. How important is Islam in your life here in America?
   (Very important / Important / Not very important)

2. Do you pray five times a day?
   (Yes, always / Most days / Sometimes / Rarely / No)

3. Do you listen to Quran recitations?
   (Every day / Often / Sometimes / Rarely / Never)

4. How often do you go to the mosque?
   (Every Friday / Sometimes / Only for Holidays / Rarely / Never)

5. When you have a problem, do you seek advice from the Quran or Hadith?
   (Always / Often / Sometimes / Rarely / Never)

6. Do you feel comfortable practicing Islam in America?
   (Very comfortable / Somewhat comfortable / Not comfortable)

7. How often do you speak with an imam or religious leader about your concerns?
   (Often / Sometimes / Rarely / Never)

8. Do you feel your Somali culture and Islamic faith are connected?
   (Strongly connected / Somewhat connected / Not connected)

9. Would you be open to combining Islamic practices with other ways to improve your well-being?
   (Yes / Maybe / No)

Usefulness of Islamic problem-solving and stress management techniques

1. The Islamic stress management techniques we practiced were helpful.
   - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
   - Disagree, Kuma Raacsani (2)
   - Neutral, Dhexdhexaad (3)
   - Agree, Waan ku Raacsanahay (4)

    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
2. I felt comfortable using du'as or dhikr as a breathing exercise.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
3. Combining Islamic practices with PM+ made the strategies more meaningful to me.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
4. The Islamic practices we learned fit well with my existing religious practices.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
5. Learning about how the Prophet (PBUH) handled challenges was relevant to my situation.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
6. Combining du'as or dhikr with breathing exercises helped me feel calmer.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)
7. I found it natural to use du'as or dhikr while practicing the breathing techniques.
    - Strongly Disagree, Aad ayaanan ugu Raacsaneyn (1)
    - Disagree, Kuma Raacsani (2)
    - Neutral, Dhexdhexaad (3)
    - Agree, Waan ku Raacsanahay (4)
    - Strongly Agree, Aad ayaan ugu Raacsanahay (5)

Appendix C: Participant Characteristics Table

Participant ID	Age	Years in US	Zip Code
P01	65	40	98108
P02	58	17	98108
P03	69	18	98108
P04	68	12	98108
P05	75	23	98108
P06	54	26	98108
P11	31	19	98198
P12	22	Born in US	98030
P13	18	12	98118
P14	24	12	98108

Sample Characteristics: The sample included ten Somali Muslim women across three generational cohorts: older immigrants who migrated as adults (ages 54-75, n=6), younger immigrants who migrated as children or adolescents (ages 18-31, n=3), and one second-generation participant born in the US (age 22). Geographic concentration was high, with seven participants residing in South Seattle (98108).

Religiosity: All participants demonstrated high religiosity, rating Islam as very important in their lives and praying five times daily. This religious homogeneity was essential for

evaluating Islamic adaptations, as the sample provided perspectives across different acculturation experiences while maintaining the cultural and religious consistency needed to assess acceptability of Islamic integration within PM+.

Appendix D: Coding Schema

3R Strategies Coding Framework

Code	Definition	When to Use	Example
Reframing	Introducing alternative interpretations of barrier beliefs within an Islamic framework that normalize beliefs while facilitating health behaviors	Use when participant describes seeing a practice in a new light through Islamic perspective	Acknowledging difficulty of stress management but reframing as earning spiritual rewards through hardship
Reprioritizing	Introducing facilitative Islamic beliefs that align with health behaviors to instill greater resonance and motivation	Use when participant describes prioritizing certain Islamic values to motivate new behaviors	Emphasizing Islamic teaching that righteous hearts reside in healthy bodies
Reforming	Directly addressing misconceptions by uncovering logical flaws or misinterpretations of Islamic teachings specific to mental health	Use when participant describes changing incorrect understanding of religious teachings	Correcting belief that seeking mental health treatment conflicts with Islamic faith

Implementation Outcomes Coding Framework

Code	Definition	When to Use
Acceptability	Perception that the Islamic adaptations are agreeable, palatable, or satisfactory	Use when participant discusses how they feel about the adaptation emotionally
Appropriateness	Perceived fit, relevance, or compatibility of Islamic adaptations with religious values and cultural context	Use when participant discusses how well the adaptation fits their Islamic beliefs
Feasibility	Extent to which Islamic adaptations can be successfully used or carried out in participants' daily lives	Use when participant discusses practical aspects of using the adaptation

Sustainability	Extent to which Islamic adaptations can be maintained over time	Use when participant discusses continued or future use of adaptation

Islamic Adaptation Types Coding Framework

Code	Definition	When to Use
Religious Practice Integration	Adaptation of slow breathing exercises to incorporate Islamic phrases (du'as or dhikr)	Use when participant discusses how Islamic prayers or devotional practices are combined with PM+ techniques
Religious Narrative Application	Use of narratives about Prophet Muhammad to illustrate problem-solving or coping approaches	Use when participant discusses how religious stories or teachings help them understand or relate to PM+ concepts
Islamic Conceptual Frameworks	Integration of Islamic theological concepts to reframe PM+ principles for emotional resilience	Use when participant discusses how Islamic concepts help them understand mental health or problem-solving
Islamic Daily Structure	Alignment of PM+ activities with Islamic daily practices and routines	Use when participant discusses how PM+ activities fit within their religious routines