Evaluation of the Feasibility of a Yoga and Mindfulness-Based Mental Health Intervention for Latina Immigrant Mothers

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Abstract

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Latina immigrant mothers are at increased risk for poor mental health due to significant economic, social, and cultural challenges of caregiving throughout the process of migration and resettlement. Over recent years, mindfulness has become a popular framework for mental health interventions in varied community settings. Yoga and mindfulness modules were developed for the existing Amigas Latinas Motivando El Alma (ALMA) program to reduce symptoms of depression, anxiety, and parenting-related stress among Latinas. This project evaluated the feasibility of the new modules among a community sample of 24 Latina immigrant mothers in Seattle using a mixed methods approach. Findings suggest the program was successful in reducing symptoms of depression and anxiety and indicate the participants' overall satisfaction with session content. Further evaluation is needed to test the feasibility among a larger, more diverse sample. Future research should address the need for more culturally specific measures to assess mental health outcomes among this population.

BACKGROUND

As of 2015, the United States is home to over 41.3 million immigrants. These individuals, along with their U.S. born children, comprise over one quarter of the nation's population, with the majority immigrating from Central and South America (Fry, 2009). With this great influx of immigration over the last few decades, there is an increasing need for ways to address the health concerns related to the process of migration and challenges of living as a Latino immigrant in America. The significant physical and psychosocial stressors that Latinos face during migration and resettlement put them at increased risk for anxiety, depression, and other adverse mental health outcomes (Alegría et al., 2008). Latino immigrants, compared to white non-immigrants, suffer from increased rates of negative mental health outcomes (Menselson, Rehkopf, & Kubzansky, 2008), placing them in the need of targeted, culturally-tailored mental health interventions.

Latina immigrant women are particularly at risk for poor mental health due to significant social, cultural, and economic challenges including migration-related trauma, added gender-role expectations, social isolation, linguistic barriers, and discrimination (Ornelas & Perreira, 2011). As such, Latina immigrant women suffer from higher rates of anxiety and depressive symptoms than their male counterparts, and are often found to have worse mental health outcomes than white women (Ai, Appel, Huang, & Lee, 2012; Alegría et al., 2007, 2008; Vega et al., 1998; Wassertheil-Smoller et al., 2014). These disparities are exacerbated for Latina immigrant mothers, who are also caring for their families and ensuring their children's well-being in the context of low education, poverty, and scarce access to resources that often accompany life as a Latino immigrant parent. Not surprisingly, Latina mothers experience higher rates of parenting-related stress than white, non-Latina mothers (Nam, Wikoff, & Sherraden, 2013).

In the response to increasing need for interventions to combat specific stressors and negative mental health outcomes of this highly marginalized population, the Amigas Latinas Motivando el Alma (ALMA) intervention was created to support the growing Latina immigrant community of North Carolina. ALMA is a culturally tailored theory-based intervention aimed at improving the mental health and well-being of Latina immigrants in community settings. Designed to decrease mental health disparities, the ALMA intervention focused on increasing coping skills, establishing social support, and decreasing barriers to accessing mental health care for recently immigrated Latinas. The intervention, when piloted using a pre- and post-test study design, was found to decrease symptoms of depression and stress among 48 Latina women (Tran et al., 2014).

Over the past few decades, research has begun to incorporate mindfulness practices into mental health interventions. Mindfulness involves the practice of non-judgmental awareness of present thoughts and emotions, often incorporating common practices such as yoga, tai chi, and meditation. These practices have been shown to positively impact physical and mental health in a variety of community and clinical settings (Bluth, Roberson, & Gaylord, 2015; Falsafi & Leopard, 2015). Recent research has highlighted the positive impact of mindfulness-based meditation on reducing symptoms of anxiety and depression (Marchand, 2013; Serpa, Taylor, & Tillisch, 2014). Specifically, mindfulness-based stress reduction (MBSR), a treatment approach that combines mindfulness meditation techniques with yoga and body-awareness practice, has been used to address high stress and trauma in community interventions (Hou et al., 2014; Martín-Asuero & García-Banda, 2013). Several studies have also indicated the positive benefits of yoga practice alone on mental health outcomes in a various community settings (Louie, 2014; Sheffield & Woods-Giscombé, 2015; Uebelacker et al., 2010).

Despite the mounting evidence linking yoga and mindfulness practices to improved mental health, these interventions have traditionally been designed for and implemented within non-diverse, affluent communities. Little evidence exists regarding their effectiveness in immigrant and underserved populations, including Latinos. Similarly, little to no evidence exists regarding whether mindfulness-based interventions can combat stressors specific to the Latino immigrant experience such as migration, acculturation, and parenting. As a result of these significant gaps in research among this population, additional modules of the existing ALMA intervention were created to incorporate yoga and mindfulness to promote the mental health of Latina immigrant women. Specifically, the modules focused on compassionate awareness, mindful movement, compassion for others, compassion for self, and barriers to practice. We assessed the feasibility and acceptability of the new content in a pilot study with Latina immigrant women in Seattle. Our study aims were: 1) To describe the characteristics and demographics of the ALMA study participants; 2) To assess the feasibility of implementing the new ALMA modules among the study population; and 3) To estimate the potential efficacy of the intervention on mental health outcomes using pre- and post-survey data.

METHODS

A. Setting

This study occurred in the city of Seattle, which is currently home to almost 250,000 Hispanic-identified residents, 38% of who are foreign-born. These residents account for roughly 9% of the metropolitan area's population and are of mostly Mexican descent (PEW Hispanic Center, 2011). Casa Latina, a Seattle-based non-profit organization aimed at providing educational and economic opportunities to the local Latino immigrant community, served as the community partner for this project. All participant recruitment, data collection, and intervention

components occurred on site at Casa Latina. Funding was provided by the Center for Child and Family Well-Being at the University of Washington.

B. Sample

Participants were primarily drawn from an existing weekly women's group at Casa Latina. The group, Mujeres Sin Fronteras, was created to provide advocacy and empowerment resources to Latina immigrants in Seattle. An announcement was made during the weekly meeting to explain the project and advising those who were interested to attend the study's orientation session. Casa Latina staff also advertised the program in their newsletter and on social media to recruit several new members. To be eligible for participation in the study, each woman had to be at least 18 years old, Spanish-speaking, born outside of the U.S., and have at least one child. If deemed eligible, each woman was taken through the informed consent process with a member of the research team where the research intentions, procedures, and potential risks and benefits were made explicit. We recruited a total of 24 women to participate in the study.

C. Study Design

The intervention consisted of five weekly 2-hour classes, occurring in the evening, after work hours. Childcare, food, and refreshments were available to all participants at each session. Sessions were led by a Spanish-speaking yoga and mindfulness instructor, who has experience teaching these approaches in underserved communities, and assisted by a Spanish-speaking Graduate Research Assistant. We conducted all sessions in Spanish and all corresponding materials and instructions were also provided in Spanish. Upon completion of the program, all participants received a small gift during the final session as a token of appreciation from the research team.

Curriculum

Evidence-based yoga and mindfulness techniques served as the anchoring content for the new ALMA intervention modules, which were adapted to be culturally relevant to Latina immigrant mothers. These new modules were designed to promote coping and self-care among this population, with the ultimate objective of improving mental health. Mindfulness, often termed mindful meditation, encourages nonjudgmental awareness of one's thoughts and emotions as they occur in the moment. The practice, deeply rooted in Buddhist teachings and meditation, emphasizes the interconnectedness of mind and body through this moment-to-moment awareness of physical sensations and emotional processes. With continued practice, one is thought to cultivate the ability to be fully present and to bring compassion to interactions with self and others.

The 5 intervention sessions introduced participants to basic principles of mindfulness, focusing on the two wings of compassion and awareness. To convey these ideas, the sessions explored mindfulness of the body, awareness of thoughts and emotions, and mindfulness of one's connection with the environment and those around them through the use of meditation, movement, and interaction between participants. With guided instruction, participants were encouraged to develop "everyday mindfulness" practices that they could continue upon completion of the program. Participants were also introduced to and taken through several yoga sequences, or sun salutations, during each practice to encourage breath-centered focus and body awareness, and to facilitate further physical and mental relaxation. Each session emphasized the use of these various techniques for relaxation and self-care in order to combat the stressors of settling in a new environment and raising children.

Below outlines the 5 intervention sessions and corresponding curriculum content.

Session	Title	Content
Pre	Orientation	Pre-survey interviews; Introduction to Mindfulness • What does mindfulness signify for you? • Definition of key terms and theories
ALMA 1	Introduction to Compassionate Awareness	• Two wings of mindfulness: compassion and awareness • Meditation; compassionate awareness of breath • Images: what does compassion look like for you?
ALMA 2	Mindful Movement	• Meditation: compassionate awareness of thoughts/feelings • Movement: how to bring mindfulness to yoga poses using breath and awareness
ALMA 3	Compassion for Others	• Beginning yoga sequences • Building compassion for others: barriers to harboring compassion for others • Bringing mindfulness to parenting and family interactions • Meditation: practicing loving kindness for those around you
ALMA 4	Compassion for Self	• Discussion of why it is important and why it is easier or harder than compassion for others • Self-compassionate mindful movement (yoga): listening to our bodies • Individual writing reflection and group share: barriers to self-compassion
ALMA 5	Barriers to Practicing Mindfulness	• Barriers to practice in day-to-day life. When can we find a minute to dedicate to practice? • Group mindful movement practice (yoga) • Self-compassion letter: mindfulness intentions and goals for future
Post	Reflections of the Journey	Post-survey interviews • Final discussion: which practices worked best for you? Which will you continue to use? • Open sharing time and closing celebration

D. Data Collection

Participants completed surveys with a member of University of Washington study team both before and after the ALMA program. The interviewers were 7 university-affiliated students or staff. They were all Spanish-speaking with training in the IRB protocol and survey administration. The interviewers administered surveys, one-on-one, in private locations, with

participant responses hand-recorded by the interviewer on paper. Participants were given a $20 gift card for each survey completed, totaling a possible $40 for study participation. Prior to completion of the pre-intervention survey, informed consent was obtained from each participant. Responses were electronically entered into Research Electronic Data Capture (REDCap) software after completion of all surveys.

We conducted pre-intervention surveys during the orientation session of the program, held at the same time and location as the remainder of the program. We advised interested participants to attend this session where the program instructor outlined intervention content and introduced mindfulness by defining key terms. During this time, interviewers pulled women out one-by-one to assess eligibility, obtain informed consent, and conduct surveys. Those who did not meet the study's eligibility criteria were returned to the orientation group and encouraged to continue to attend future sessions. We conducted post-intervention surveys at a follow-up session held the week following the final session of the program. Interviewers pulled participants out one-by-one to complete surveys while the program instructor led closing remarks and wrap-up activities with the remaining group.

This study employed a pre- and post-test research design to test the feasibility of the new content and data collection procedures among the study population. Primary and secondary outcomes were measured at two points: prior to the intervention and after the intervention had been completed. Primary outcomes included measures of depression and anxiety, while secondary outcomes included perceived stress, parenting stress, and mindful awareness. During the pre-survey interview, participants were also asked a series of demographic questions to gather information about the sample.

E. Measures

Participant demographics: Participants were asked to report several demographic characteristics as part of the pre-intervention survey. These questions included age, country of birth, years spent in the U.S., years spent in the Seattle area, highest level of education completed, employment status, marital status, and languages spoken. They were also asked to report their weekly family income, number of children, and to list all the members of their household, including relationship to participant and age.

Attendance: Research staff recorded the number of participants present for each of the 5 ALMA sessions as well as pre- and post-survey sessions. These counts include study participants and all attendees, as sessions were not restricted to solely those who enrolled in the study. To incentivize retention and overall attendance, participants were gifted "wellness tote bags" if they attended 4 or more sessions.

Primary Outcomes

Depression: A Spanish version of the Patient Health Questionnaire-9 (PHQ-9) was used to measure depressive symptoms (Kroenke, Spitzer, & Williams, 2001). The 10-item measure asks participants to report how often they have experienced various depressive symptoms over the last two weeks. Responses range from 0 (Not at all) to 3 (Almost every day), resulting in a total score range of 0 – 27 with a score of 10 or greater indicating moderate to severe depression.

Anxiety: Anxiety symptoms were measured using a translated version of the Generalized Anxiety Disorders-7 scale.(Spitzer, Kroenke, Williams, & Löwe, 2006) This 7-item measure gauges frequency of anxiety-related symptoms over the last 2 weeks, with responses ranging from 0 (Not at all) to 3 (Nearly every day). Total scores range from 0 – 21 with a score of 10 or

greater indicating moderate to severe anxiety that would merit further evaluation for Generalized Anxiety Disorder.

Secondary Outcomes

Parenting Stress: To assess changes in stress associated with parent-child interactions, we used the 17-item Likert-type Parental Stress Scale (PSS) (Berry & Jones, 1995). Participants were asked to report to what degree they agree with parenting-related statements, with options such as "Totally in agreement" and "Totally in disagreement." Negative items are reverse scored and responses are summed for a possible score range from 18 – 90. Higher scores indicated greater levels of parental stress. The Spanish version of this scale has been validated when used among Spanish-speaking populations (Oronoz, Alonso-Arbiol, & Balluerka, 2007).

Perceived Stress: The Perceived Stress Scale (PSS) was used to assess overall stress level of participants. The 10-item PSS scale measures to what degree events in the participant's life are stress-inducing (Cohen, Kamarck, & Mermelstein, 1983). Recalling the last month, participants were asked how often they experienced certain thoughts or feelings such as, "how often do you feel unable to control the important things in your life?" To calculate a total PSS score, seven positive items are reverse scored and then scores for all ten items are summed. Total scores range from 0 – 40 with higher scores indicating higher measured perceived level of stress. The PSS has been found reliable when used among Spanish-speaking populations (Ramírez & Hernández, 2007).

Mindfulness: The Mindfulness Attention Awareness Scale (MAAS) was utilized to evaluate quality of consciousness and well-being associated with increased self-awareness (Brown & Ryan, 2003). The 15-item measure uses a 6-point scale to ask participants how often they experience mindful thinking and awareness, with response options ranging from "1-Almost

always" to "6-Almost never." An average is taken of the 15 responses for a total possible score range from 1 – 6 with higher scores indicating greater mindful awareness. A translated version of this scale has been previously used in Spanish-speaking community settings (Tejedor & Pascual, 2012).

Process Measures

Session Observer Notes: A Graduate Research Assistant recorded observations for each of the intervention sessions, including the content covered, extent of participation and engagement with material, activities performed, and any issues that arose during the session.

Participant Satisfaction: As part of the post-intervention process, participants were asked to respond to a set of open-ended questions pertaining to their experience with the intervention, retention of study content, and overall satisfaction with the research process. Qualitative questions covered use of content ("What were the most helpful things you learned in the ALMA program? Can you describe a situation when you used a strategy you learned?"), connection to parenting ("How has the program impacted your parenting?"), and suggestions for program modification ("Is there anything that could be done to improve the program? Do you have any other comments for the research team about your experience in the program?"). Because interviews were not recorded, interviewers were required to write notes during the survey that included quotes and main ideas for each of the participant's responses.

F. Data Analysis

The present study utilized the previously collected ALMA pilot data to complete the following research aims. Quantitative analysis was preformed using SPSS statistical software in order to calculate rates of attendance and analyze pre- and post-intervention survey measures.

Aim 1: Describe characteristics and demographics of study participants

Demographic characteristics and the mental health status of the study sample were described using baseline survey data collected from participants. We calculated the frequency and proportion of demographic characteristics in the sample, including age, country of birth, education, household size and makeup, marital and employment status, language, and income. To describe mental health status of the sample, we calculated means and frequencies of pre-survey levels of depression, anxiety, and stress.

Aim 2: Assess feasibility of implementing new ALMA content among study population

We calculated counts of recruitment and retention based on data collection and attendance records. These numbers were also used to calculate attendance at each session, which were used to assess "dose" of the intervention content. We assessed program fidelity by reviewing observer notes recorded at each of the five sessions. We then compared these to the planned session themes and activities. We used these notes to determine to what degree the course curriculum was followed and implemented. Similarly, the notes served to inform us about activity participation and satisfaction with material in addition to how well received and understood the content was, and what specific elements seem to influence overall participation and satisfaction.

We analyzed responses to the open-ended "participant satisfaction" questions for content and consistent themes across the sample. These questions provided information about the personal relevance of the content, participant enthusiasm, and level of knowledge participants

retained. These responses provided ideas for future delivery of the intervention, as well as insight into the overall acceptability of curriculum content among this sample.

Aim 3: To assess the potential efficacy of the intervention on mental health outcomes using pre- and post-test pilot data

We assessed levels of depression, anxiety, parenting-stress, and mindful awareness among participants prior to and following the 5-week intervention. Means and frequencies of all outcomes of interest were calculated and paired t-tests were performed to compare participant scores from pre- and post-test survey data using a 90% confidence interval. This wider confidence interval was selected to account for the relatively small sample size. Additionally, we compared participant outcomes across different levels of attendance. It was hypothesized that participants who attended more sessions would have greater changes in outcome measure scores, particularly anxiety and depression scores, due to receiving a larger "dose" of the intervention. Pre- to post-intervention change in depression and anxiety measures was also stratified by participant baseline distress, indicated by baseline anxiety and depression scores, to assess whether outcomes varied by baseline mental health status.

RESULTS

A total of 24 mothers were enrolled in the study and participated in baseline data collection. Descriptive statistics for participant demographics are provided in Table 1. Participants were predominately Mexican (79%), married (65%), and with an average 2.8 children. The majority of the women were employed year-round (54%), have lived in the U.S. over 10 years (62%), and with a mean age of 49. Participant baseline measurements of mental health are summarized in Table 2. While scores of parenting stress, perceived stress, and

mindfulness among participants were comparable to those of previous studies, the majority of participants had scores indicating mild levels of depression (71%) and anxiety (75%).

Tables 3, 4, and 5 show the participant attendance at the sessions. Sessions were open to the public, regardless of whether the participant was enrolled in the study. Table 3 displays attendance counts for enrolled participants versus total attendees at each session. Of the enrolled participants, 12 women (50%) came to at least 4 sessions and 12 came to 3 or fewer (50%) (see Table 4). One enrolled participant didn't attend any sessions and 4 participants attended only one. An average of 5.2 non-enrolled participants attended each intervention session. 21 participants completed the post-intervention survey measures, resulting in an 87.5% retention rate from baseline to follow-up.

We present means and standard deviations for intervention outcome measures before and after the intervention in Table 5. The largest mean changes occurred in levels of depression (19.1% decrease) and anxiety (26.3% decrease). Mean scores of mindful awareness after the intervention decreased 12.5%. We also examined whether changes in depression and anxiety varied by the number of sessions women attended. Changes in scores on both depression and anxiety were greater for those participants who attended a greater number of ALMA sessions (Tables 6 & 7). Changes in anxiety levels from baseline to post-intervention were three times greater for participants who attended 4 or more sessions (42% decrease) compared to those who attended 3 or fewer (13% decrease). Mean changes in participant depression scores from baseline to post-intervention followed a similar trend, with a 26% decrease for attendees of 4-5 sessions versus a 15% decrease for those who attended fewer than 3 sessions (Table 6). These patterns indicate that those who received a larger "dose" of intervention content, as measured by number

of sessions they attended, had larger decreases in their levels of depression and anxiety. However, these differences were not statistically significant.

Table 8 shows changes in levels of depression and anxiety stratified by participants' mean baseline score. Greater decreases in mean scores were observed among participants with higher baseline levels of depression and anxiety. In particular, participants that reported moderate to severe anxiety symptoms at baseline had significantly greater mean changes post-intervention (44.3% reduction) than those who reported mild anxiety symptoms at baseline (10.5% reduction).

Participant Interviews

We analyzed interviewer notes describing participant open-ended responses during follow-up data collection in Spanish for content and consistent themes. Responses were then synthesized and specific quotes were translated into English for reporting and dissemination. Qualitative analysis of participant feedback suggested several themes, shown in Table 9.

Most useful content

When asked to indicate which course content was most useful, participants highlighted learning meditation exercises, breathing for relaxation and yoga poses as being most helpful. As one woman explained:

> *Las más útiles fueron el yoga y la meditación. El yoga me gustó mucho para aprender a encontrarme a mi misma; mis valores. Me ayudó a meditar y a tener mi espacio y cambiar a pensamientos más positivos.*
>
> *The most useful were classes on yoga and meditation. I really liked yoga because it helped me to rediscover myself and my values. It helped me to meditate in my own space and change my thoughts to be more positive.*

Many women responded to lessons on self-reflection and self-compassion, noting that they felt more in touch with the needs of their bodies:

...Quererme más, meditar más, conocerme más a fondo y aprender a relajarme.

[The classes have helped me] love myself more, meditate more, know myself deeper, and learn to relax.

Practical Application

In response to how they use the content in their day-to-day lives, several participants indicated improved sleeping habits as a result of the meditation and breathing techniques learned in the sessions:

Si, hago los ejercicios para acostarme… En una ocasión me dio ansiedad y usé estos ejercicios de estirarme antes de acostarme.

Yes, I use the [meditation and stretching] exercises to fall asleep…One time, I was feeling very anxious and I used the exercises to stretch before falling asleep.

Others reported taking time out of their busy days to spend a minute alone to practice mindfulness, often while in nature:

Uso los ejercicios de meditación. Trabajo en housekeeping y cuando tengo tiempo hago algunos de los ejercicios que aprendí. También voy al parque donde están los arboles y veo los pájaros y siento el viento.

I use the meditation exercises. I work as a housekeeper and when I have time, I do some of the exercises that I learned. [Referring to mindfulness techniques] I also go to the park where there are trees and just watch the birds and feel the wind.

When experiencing feelings of stress or anxiety, respondents noted the positive benefit of breathing and relaxation exercises in relieving symptoms. Several women also reported practicing yoga poses to relax and relieve stress. For example, one woman stated:

Si, el yoga en la casa. Se me quita el estrés cuando hago el yoga. También la meditación del pecho me sirve mucho con el estrés.

Yes, [I like to do] yoga at home. When I do yoga, it alleviates my stress. The chest meditations also really help me to feel less stressed.

Influence on Parenting

When asked how the program had impacted their parenting practices, several women noted that their children were grown adults and therefore it had little to no impact on their interactions. Still, many participants stated the usefulness of program content on encouraging more patience and openness in parent-child interactions. Several responses indicated a newfound ability to listen and wait before reacting in stressful situations with children, resulting better communication. One woman explained:

> *Me calmo un poquito. No me altero rápido. Si me enojo, no les grito como lo hacía antes. Estoy más calmada…cuento hasta 10.*
>
> *I've calmed a bit. I don't get angry as easily. If I get angry, I don't yell at them like I would before. I am more relaxed now…I count to 10 [before responding].*

Another woman echoed the program's positive effect on her parenting:

> *Me ayudó positivamente con mis hijos. Pienso cómo ayudar a mis hijos y aprendí a controlar mi estrés para que maneje mejor las situaciones con ellos.*
>
> *[The program] has helped me positively with my children. I think how to help them and I have learned how to control my stress so that I can better handle situations with my kids.*

The women noted that taking time for self-care practices and self-reflection had improved their ability to care for their children:

> *Han sido muy buenos para mi. A veces estaba enojada y grité mucho a mis hijos pero ahora puedo escucharme a mí misma y a mis necesidades. Mis hijos notan la diferencia en mis emociones.*
>
> *[The classes] have been really good for me. Many times, I would get angry and yell at my children but now I can listen to myself and to my needs. My children notice the difference in my emotions.*

Program Improvements

Finally, participants were also asked about their overall satisfaction with the program and how it could be improved. While many of the women reported a high level of satisfaction with the existing content and structure, several noted that more sessions, and/or more frequent sessions, would be beneficial. Other responses indicated the necessity for a larger space to accommodate more participants and an additional instructor to give women more individualized instruction during the yoga components. Several women alluded to the importance of the sessions and overall content to the participants. One woman explained:

> *Se necesitan mucho estás clases de yoga. Ayudan mucho. Muchas vienen muy estresadas y lloran cuando cuentan sus cosas. Esto lo necesitamos.*
>
> *These yoga classes are very necessary—they really help. Many women come very stressed and cry when they tell their stories. We need this.*

Another woman addressed the cultural significance of the ALMA curriculum:

> *Hablar más del tema de la compasión. En nuestra cultura, no nos hablan mucho de este tema.*
>
> *[It would be better to] speak more about the subject of compassion. In our culture, they don't speak to us much about this.*

Overall, participants found the program very favorable and worthwhile. As two women expressed:

> *Fue algo magnifico. Quisiera seguir practicando. No me gustó, ¡me encantó!*
>
> *It was magnificent. I would like to continue practicing. I didn't like it—I loved it!*

> *Gracias por pensar en nosotras. Yo me llevo mucho con lo que aprendí. No todos tienen esta oportunidad.*
>
> *Thank you for thinking of us. I will always carry with me what I have learned. Not everyone has this opportunity.*

DISCUSSION

This study tested the feasibility of including yoga and mindfulness as additional content to the ALMA intervention aimed at reducing depression, anxiety, and stress in Latina immigrant mothers. Those who participated in the modified ALMA program demonstrated reduced symptoms of depression, anxiety, and stress after receiving the intervention. To our knowledge, this is the first study to test the feasibility of a mindfulness-based mental health intervention targeted at this highly underserved population. This study provides support for the continued development and evaluation of community-based programs that promote coping and self-care strategies within underserved, ethnically diverse communities. Specifically, the findings of this study suggest that this population is in need of culturally tailored interventions addressing the unique stressors associated with resettlement and parenting as a Latina immigrant.

Participant Characteristics

Our sample's demographics largely reflected the foreign-born Hispanic composition of Seattle with the exception of age, marital status, and education. Our participants were on average older, more likely to be married, and more likely to have obtained a high school diploma than the reported numbers for Seattle's foreign-born Hispanic population (PEW Hispanic Center, 2011). Discrepancies in both variables of age and marital status are likely due to our study's exclusion of participants who were not mothers.

Participant baseline scores of depression and anxiety in our sample were comparable to those reported in national surveys of Latina immigrants. At baseline, 29.2% of our participants reported experiencing moderate to high levels of depressive symptoms. The Hispanic Community Health Study/Study of Latinos reported a moderate to high depression prevalence of 32.8% among Latina women, measured using the Center for Epidemiological Studies Depression

Scale (Wassertheil-Smoller et al., 2014). Overall, few studies have reported anxiety rates among Latina immigrant women using the GAD-7 scale, making it difficult to compare our findings to other samples. Among the women in our study, 25% reported experiencing moderate to severe anxiety symptoms. In comparison, the National Latino and Asian American Study (NLAAS) found that the lifetime prevalence of anxiety disorder was 21% among Latina women (Alegría et al., 2007). However, this NLAAS figure only includes those that have been diagnosed with an anxiety disorder, excluding those that are undiagnosed or have not sought treatment.

A mean baseline score of perceived stress (PSS) of 27.1 indicates that our sample lives with levels of stress comparable to those reported in other diverse community samples. Silveira and colleges, for instance, reported a mean score of 26.2 among a sample of 1,426 pregnant Hispanic women (Silveira, Pekow, Dole, Markenson, & Chasan-Taber, 2013). Conversely, our sample's mean baseline score of parental stress was higher than what has previously been reported in the literature. While no studies to our knowledge exist using this scale among Latina immigrant mothers, a study validating a Spanish-version of the PSS among 106 Spanish mothers reported a mean score of 22.3, compared to our sample's mean baseline score of 38.1 (Oronoz et al., 2007). This increased level of parental stress among our sample speaks to the unique pressures associated with parenting as a Latina immigrant and highlight the need for further research on interventions that target population-specific stressors.

Overall, our sample demonstrated low to moderate levels of mindfulness awareness at baseline. Similar to the previously mentioned measures, further research utilizing the Mindful Attention Awareness Scale (MAAS) among Latino populations is scarce. As a relatively new measure, research including normative information for the scale is now just starting to emerge. Brown & Ryan, the researchers credited with developing the scale, report a mean MAAS score

of 4.2 among 4 independent community samples of adults, indicating a moderately high level of dispositional mindfulness. This mean falls higher than that of our sample (3.2). However, it is difficult to discern the relative value of our sample's mean due to a lack of research validating this scale among Spanish-speaking Latino immigrants.

Program Implementation

Attendance and Retention

This project sought to assess the feasibility of new ALMA content within a specific Spanish-speaking, low-resource population. The average number of enrolled participants at the intervention sessions was 15, while average total in attendance was 20. Half of the enrolled participants attended the majority of intervention sessions (4 – 5) and almost three quarters attended 3 or more. Our findings related to participant attendance were encouraging, especially among a sample of women with very little free time outside of work and caregiving. In part, maintaining the same day and hour of the existing women's group allowed for the participants to not have to readjust their schedules to attend the intervention sessions. These rates are also surprising given that several of the participants live outside of Seattle and would commute to Casa Latina. Once a convenient neighborhood locale for Latino immigrant families, the recent housing crisis and climbing rents have pushed many of them further south, outside of the city. While this did not seem to inhibit attendance for our study, it is an important consideration for future programs. Choosing a location that is more widely accessible would perhaps allow for broader reach in terms of recruitment.

While the research team felt it important for sessions to remain open to all community members regardless of enrollment status, the fluctuating attendance numbers made it difficult to prepare for weekly sessions. A set attendance count would have allowed us to properly anticipate

the materials needed for each session and the necessary time to allot for each planned activity. These high attendance counts created some issues with physical space as well. With more attendees in the confined space, it was often over-crowded and the relaxing environment needed to practice meditation and yoga was occasionally disrupted.

Intervention Content

While the majority of content was touched on over the course of the intervention, more time was needed to cover the mindfulness subtopics outlined for each session than was initially anticipated. Additionally, transition intervals between discussion and yoga practices on the floor used up time that was not budgeted. Despite these timing setbacks, all outlined themes and lessons were successfully carried out, albeit in less detail than initially planned. Much thought was given to the language used during the sessions to unpack and properly define mindfulness as a construct. Because the Western conceptualization of yoga and mindfulness is arguably culturally restrictive and often only circulated among higher income communities, it was imperative to convey these practices as they relate to self-care and coping for Latina mothers in our intervention. With a relatively short timeframe to explain this topic, it proved very useful to have an instructor with previous experience guiding mindfulness practice within underserved communities. However, for future programs, an additional assistant or fellow instructor familiar with teaching yoga and leading mindfulness meditation would have proved useful in this type of group setting. During yoga sequences, there were many instances when the instructor was occupied with explaining the movements and was unable to walk the room and correct postures or assist with difficult poses. To ensure the safety of participants and success in mastering the material, we feel that additional support would be advantageous.

Overall, the women responded well to the curriculum content, asking questions when clarification was needed. It was clear through participant comments that the key components of meditation, self-reflection, and thought awareness were understood. Specifically, the participants reacted positively during guided meditations and when practicing yoga. Several women made comments during the sessions that they left feeling more relaxed and with less muscle tension than when they arrived. While some were physically unable to practice yoga on the mat or certain positions, a concerted effort was made by all to participate to the best of their ability. Future studies involving yoga and movement practices among age-varying populations would benefit from considering the physical limitations of participants during program development and planning.

Participants seem to have the strongest reaction to the activities and discussion related to self-compassion. Several comments were made during these activities that the women are very seldom asked to think of themselves, a theme that carried throughout the remainder of the sessions. Many of these women play the role of caretaker and worker, rarely putting their own needs first. As such, when the topics of self-compassion and self-reflection were discussed, many of the participants became very emotional. Among a sample of women that undoubtedly has experienced varying degrees of trauma and distress, it is understandable that being asked to self-reflect may be easier said than done. For many of our participants, it is possible that their demonstrated resilience to poor mental health is the result of many years of suppressing negative thoughts and experiences as a means of coping. As reflected in previous mental health studies among Latina immigrants, it is important to be cognizant of this prior trauma and adversity when designing and implementing interventions (Kaltman, Green, Mete, Shara, & Miranda, 2010; Kaltman, Hurtado de Mendoza, Gonzales, Serrano, & Guarnaccia, 2011).

Mental Health Outcomes

Overall, the 21 women who completed a post-intervention assessment experienced decreases in depression, anxiety, and perceived stress as hypothesized. Decreases in levels of depression and anxiety were greater for those who attended more sessions. It should be noted, however, that the women who attended more ALMA sessions had lower overall mental health scores. Participants who attended fewer sessions reported higher levels of both depression and anxiety at baseline and post-intervention compared to those with more frequent attendance. It is plausible that increased symptoms of distress prevented these women from attending more sessions.

Consistent with the program objectives, participants demonstrated decreased scores of perceived stress following the intervention. However, these changes were more modest than those observed in previous studies using mindfulness-based interventions (Baer, Carmody, & Hunsinger, 2012; Chiesa & Serretti, 2009; Morledge et al., 2013). It is possible that despite attending sessions and beginning to feel comfortable with the content, the participants realistically had little free time outside of the program to continue practicing the techniques they had learned. Perhaps with more frequent and longer sessions, the women would have more time to master the complex concepts of mindfulness and meditation and apply outside of class time. It is also important to note that our program could not decrease participant exposure to stress, but rather aimed to increase the women's ability to cope with it. This might be a possible explanation for why the intervention did not seem to impact levels of parenting stress among our sample.

An unexpected finding was that mindful-awareness scores in the sample decreased after the intervention. These results might speak to the complex and multi-faceted nature of the mindfulness content that was explored during the 5 intervention sessions. As mentioned,

mindfulness as a concept was very foreign to this group of women, as mindfulness teachings are not often disseminated among culturally-diverse, low-income populations. Therefore, while the constructs of mindfulness are simple in theory, the practice can be challenging to master and incorporate into daily life. It is also possible that the mindful attention awareness scale (MAAS) did not adequately capture the outcome of interest among our sample. The MAAS has not been previously validated in Spanish-speaking populations. As such, it is possible that the translated scale items were not well understood by participants. Interviewers reported that they often had to repeat or explain items, such as *"Yo veo mis sentimientos sin perderme en ellos/ I watch my feelings without getting lost in them,"* and *"Yo le presto atención a ciertas sensaciones como el viento que pasa por mi cabello o el sol que brilla en mi cara/ I pay attention to sensations, such as the wind in my hair and the sun on my face."* Given these challenges, it is possible that the spirit of this scale was lost through translation and items were not properly interpreted.

Translation was also a concern for our measure of parenting stress. During data collection, several women were confused when asked the extent they agree with statements such as, *"Disfruto de mi(s) hijo(s)/ I find my children enjoyable,"* and, *"Si tuviera que hacerlo de nuevo, podría decidir no tener hijos/ If I had it to do over again, I might decide not to have children."* Given the variation of scores on this measure, both pre- and post-intervention, it is difficult to interpret any changes in scores. However, given the unique the importance of family within the Latino culture, a scale designed to assess parenting-related stress in the larger non-Hispanic population might not be appropriate. Unfortunately, the appropriate cultural adaptation of measures continues to be a barrier for conducting research and implementing parenting interventions among Latino populations (Ruben et al., 2012). In order support interventions

aimed at improving the mental health of this community, future efforts should be directed at the development of a culturally-appropriate measure of parenting stress for Latino populations.

Participant Satisfaction

The findings from the participant feedback portion of data collection suggest that the ALMA yoga and mindfulness content was well received and engaging for the women in our sample. The participants, overall, reported a high degree of satisfaction not only with curriculum content, but also with the research team and intragroup dynamic. While many participants revealed that aspects of the program were initially foreign to them (namely the yoga and guided mindfulness practice), these ultimately were the activities that received the most positive feedback. As many women reported having used techniques learned in the session in their day-to-day lives for relaxation and stress-relief, we are hopeful that this is reflective of the potential sustainability and long-lasting effects of the program on Latina mental health.

Comments on suggested program improvements echoed several of the research team's observations of the benefit of a larger space to conduct the sessions and the need for an additional instructor to help monitor and correct yoga practice. While these suggested improvements are helpful in planning of future program implementation, they are also indicative of the women's content with participation and desire for the program to continue. By and large, participants expressed a desire for the intervention to be longer, with sessions occurring more frequently. Compared to the larger body of research on mindfulness-based mental health interventions, our study's 5-week curriculum is considered short. The majority of mindfulness-based interventions targeted at improving mental health outcomes span from 6 – 12 weeks, with structured MBSR courses requiring 8 – 10 weeks (Grossman, Niemann, Schmidt, & Walach, 2004; Keng, Smoski, & Robins, 2011). A longer intervention, with more frequent or longer

sessions, may yield stronger conclusions as well as increase the participants' overall sense of familiarity and comfort with the content.

In addition to feedback reported during the post-intervention interviews, it is important to note the positive encouragement the research team continues to receive from ALMA participants and Casa Latina staff regarding the program. Each time a member of the research team visits Casa Latina they are asked when ALMA will start again and how to participate. Casa Latina staff continues to express interest in hosting the program again to engage more women. This feedback compliments the themes expressed during the post-intervention surveys and is encouraging when considering future directions for the program.

Study Limitations

There are several limitations to this study that merit discussion. As previously discussed, the study population was derived from a pre-established women's support group at Casa Latina. This recruitment method may have resulted in participants that differ from the overall population in areas of social-connectedness, social cohesion, and subsequent mental health status. As such, caution must be taken when interpreting the outcome results and generalizing them to the larger Latina immigrant community. Involving multiple sites and varied recruitment efforts to engage the wider community would likely have improved the external validity of this study. Similarly, while the outcomes of this study reflected positive implications in reducing symptoms of adverse mental health, the relatively small size of our sample limits our ability to attribute these changes solely to the intervention or deem them statistically significant. A larger sample would yield stronger, more robust conclusions as to the effectiveness of intervention content and study design on mental health outcomes.

Future Directions

There are several implications of this program for future research directions. Despite a lack of existing empirical evidence, our study illustrates the feasibility of a complementary and alternative approach to improving mental health among a diverse, low-resource population. While this program was specifically tailored for Latina immigrant mothers, it provides the foundation for adaptation to other community settings and populations. Similarly, while implementing this program in an existing women's program may have limited our ability to generalize study findings, we are confident that this may indicate the potential success in other community settings with existing programming.

The pillars of the original ALMA program, to increase coping capacity and self-care behavior, are rooted in the belief that in order to care for others, one must first care for oneself. Collectively, as researchers and public health professionals, we must enhance the ability of these women to care for others without compromising their own well-being. While the reach of our program appears conservative due to small sample size, feedback from our participants highlights the potential multigenerational impact of a mental health intervention for Latina mothers. The women involved in our program are not only mothers, but grandmothers, caretakers, respected community elders, and key social figures. By fostering more positive interactions and relationships, strides towards reducing rates of stress, depression, and anxiety among the multiple-hat-wearing women of this community will undoubtedly promote the well-being of those in their networks. Future assessments of the multigenerational impact of maternal mental health interventions are necessary to build upon this notion of interconnectedness within the Latino immigrant community.

Conclusion

This study provides evidence of the feasibility and potential efficacy of a yoga and mindfulness-based, culturally adapted intervention for reducing depression and anxiety among a sample of Latina immigrant mothers. While successful among this sample, further research is needed to determine its effectiveness among a larger, more diverse population of Latina immigrants. Conclusions from participant feedback and observation suggest that Latina mothers would benefit from the self-care and relaxation techniques provided in the intervention to cope with unique and constant stressors of immigrant parenting. However, additional research on how to incorporate the Latina immigrant narrative into the instruction of yoga and mindfulness would be advantageous in making this program more accessible to this community. To continue to promote the well-being of this highly marginalized population, it is imperative that researchers and healthcare professionals be sensitive to the prevalence of trauma and distress, as well as to the unique cultural implications of parenting within the Latino community.

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APPENDICES

Table 1. Participant Characteristics (N=24)

	Mean/N	(SD) %
Age		
Younger than 45	13	54.2%
45 or older	11	45.8%
Country of Birth		
Mexico	19	79.2%
Peru	3	12.5%
Years lived in U.S.		
10 or less	9	37.5%
More than 10	15	62.5%
Education		
Less than High School	12	50.0%
HS graduate or more	12	50.0%
Marital Status		
Single	4	17.4%
Married	15	65.2%
Divorced or widowed	4	17.4%
Number of Children	2.8	-1.2
Weekly Household Income		
Less than $300	6	26.0%
$300-$500	8	34.8%
$500-$700	4	17.4%
More than $700	5	21.8%
Employment Status		
Employed year-round	13	54.2%
Temporarily employed	6	25.0%
Currently not working	5	20.8%
Languages Spoken		
Only Spanish	5	20.8%
Spanish and some English	19	79.2%

Table 2. Participant Baseline Mental Health (N=24)

Measure (Range)	Mean/N	(SD) %
Parenting Stress (18-90)	38.1	9.4
Perceived Stress (10-50)	27.1	3.8
Mindfulness (1-6)	3.2	0.5
Anxiety (0-21)	6.1	5.4
Mild	18	75.0%
Moderate	4	16.7%
Severe	2	8.3%
Depression (0-27)	6.7	5.6
Mild (0-9)	17	70.8%
Moderate (10-19)	6	25.0%
Severe (20-27)	1	4.2%

Table 3. Total Attendance at Each Session

Session	Enrolled Participants	Total Attendees
Pre-test survey	24	26
1	19	21
2	15	21
3	13	19
4	14	19
5	14	20
Post-test survey	21	24

Table 4. Frequency of Attendance at Each Session

Classes Attended	N	Percent
0	1	4.2
1	4	16.7
2	2	8.3
3	5	20.8
4	8	33.3
5	4	16.7
Total	24	100

Table 5. Pre and Post Intervention Scores on Outcome Measures (N=21)

Measure	Baseline		Post-Intervention		Change		P values
	Mean	SD	Mean	SD	Actual	Percent	90% CI
Parenting Stress	37.8	9.9	37.8	10.8	0.0	0%	N/S
Perceived Stress	26.7	3.9	25.3	5.2	-1.4	-5.2%	N/S
Mindfulness	3.2	0.5	2.8	0.7	-0.4	-12.5%	0.05
Depression	6.3	5.7	5.1	6.3	-1.2	-19.1%	N/S
Anxiety	5.7	5.5	4.2	5.4	-1.5	-26.3%	N/S

Note: Baseline values will differ slightly from Table 2 due to 3 participants lost to follow-up

Table 6. Changes in Levels of Depression Stratified By Attendance (N=21)

Session Attendance	Baseline		Post-Intervention		Change		P values
	Mean	SD	Mean	SD	Actual	%	90% CI
0-3	7.5	4.4	6.4	7.0	-1.1	-14.7	N/S
4-5	5.2	6.7	3.8	5.8	-1.4	-26.3	N/S

Table 7. Changes in Levels of Anxiety Stratified By Attendance (N=21)

Session Attendance	Baseline		Post-Intervention		Change		P values
	Mean	SD	Mean	SD	Actual	%	90% CI
0-3	6.9	5.6	6.0	6.3	-0.9	-13.0	N/S
4-5	4.6	5.5	2.6	4.2	-1.9	-42.0	N/S

Table 8. Changes in Level of Depression and Anxiety Stratified By Baseline Distress (N=21)

Baseline Depression	PHQ-9			Baseline Anxiety	GAD-7		
	Actual Change	% Change	P value		Actual Change	% Change	P value
Mild	-0.7	-18.7	N/S	Mild	-1.4	-44.3	N/S
Moderate/Severe	-2.7	-20.3	N/S	Moderate/Severe	-1.4	-10.5	N/S

Table 9. Participant Satisfaction Response Themes

Topic	Most useful content	Day-to-day use of content	Impact of content on parenting	Suggested improvements
Key themes	• Meditation exercises • Breathing exercises • Self-reflection/self-focus • Yoga • Self-compassion • Relaxation techniques • Learning to listen to the body	• Meditation and breathing exercises to help going to sleep • Breathing exercises when feeling anxious or stressed • Going to the park and practicing mindfulness under the trees • Yoga for stretching and unloosening tight muscles	• Bringing more patience to interactions with children • Having open communication with children • Yelling less and learning to listen more • Reacting appropriately in stressful or tense interactions • Taking time for self-reflection and self-care in order to become a better mother	• Different location • More & more frequent sessions • More locations • More time for meditation & yoga • Useful take-home materials (DVDs, pamphlets) • Smaller group size