Healthy Mind Healthy Living: A mindfulness-based cognitive therapy program culturally and linguistically adapted for older Korean American adults

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Abstract

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Korean American (KA) older adults experience higher risk for depression compared to Non-Hispanic whites. Healthy Mind Healthy Living (HMHL) is a single arm, pre/post pilot intervention study to test and evaluate the effect of an abbreviated telephone-based mindfulness-based cognitive therapy (MBCT-brief) protocol to reduce depression and improve sleep quality and stress. MBCT-brief was adapted culturally and linguistically for older KA adults; participants attended one of three MBCT-brief groups (8-10 participants, N=24), delivered virtually over the span of 8 weeks by a licensed bilingual/bicultural (English/Korean) clinical therapist. Survey data were collected at baseline and 9 weeks post intervention and measured depressive symptoms (QIDS-SR16), sleep quality (PROMIS Sleep Disturbance 4a), and stress (Perceived Stress Scale). The differences in the three outcome measures from pre and post were calculated using paired T-tests. We observed significant differences for changes in mean$\pm$SD for depressive symptoms and sleep quality. Post MBCT-brief, participants had a significant reduction in depressive symptoms (8.04$\pm$4.70) compared to baseline (10.29$\pm$4.22, t(23)=2.87, p=0.004). Similarly, participants had a significant improvement in sleep quality post MBCT-brief (51.03$\pm$2.82) compared to baseline (53.23$\pm$4.14, t(23)=2.53, p=0.009). Participants also had reduction in stress (17.54$\pm$4.56) compared to the baseline (17.21$\pm$3.99, t(23)=0.28, p=0.39), but it was not statistically significant. These findings indicate that culturally and linguistically adapted MBCT-brief has potential to improve symptoms of depression, sleep quality, and stress among older KA adults with limited English proficiency. Future larger trials

may want to explore the efficacy and effectiveness of MBCT-brief on depression, sleep quality, and stress with a control group.

Background

Depression has drastically risen since the first report of coronavirus disease 19 (COVID-19) in December 2019.[1] According to the Center for Disease Control, the prevalence of anxiety and depression has increased from 36.4% to 41.5% nationally.[2] While the pandemic has impacted the mental health of all age groups and populations, older adults have been disproportionately impacted.[3] Older adults, particularly those who live alone, experience social isolation and loneliness at higher rates, compared with younger groups.[4] This risk factor for depression may be further exacerbated by social restrictions during lockdown.[4] Research examining depression by race showed that older persons of color reported higher rates of emotional distress and stressors compared to White counterparts since the COVID-19 pandemic.[5] Evidently, it is important to identify and study sub-group differences among minority populations so that all communities receive the support they need.

Among older adults, Asians have experienced the greatest increase in depression, having a 5.5-fold increase, compared to White, Hispanic, and Black populations.[6] This alarming statistic may be attributed particularly to risk factors that increase the likelihood of depression among older Asian adults such as diminishing social networks,[7,8] the inability to access culturally and linguistically relevant health information,[9,10] and limited opportunities to connect with social groups.[8,7] In addition, the increase in anti-Asian hate crimes amidst the pandemic has led to changes in routine activities related to racism and negative mental health symptoms.[11] Access to mental health services is another challenge among older Asians. Approximately 89% of older Asians are foreign-born and have high levels of limited English proficiency.[12,13] Studies have shown that limited English proficiency is a prominent barrier for older Asians when seeking mental healthcare due to language difficulties associated with immigrant status.[14]

Korean American elders, a population of predominantly first-generation immigrants, are at a higher risk for depression with rates of probable depression being four times greater compared to Non-Hispanic White and African American elders.[15,16] Furthermore, Korean American elders reported the highest psychological distress compared to Chinese, Filipino, Japanese, and Vietnamese participants in the 2007 California Health Interview Survey

(N=51,048).[17] Despite the higher rate of depression among this population, older Korean American adults are not accessing mental health services due to low mental health literacy, language barriers, and stigma.[18] The intersection of these critical risk factors for depression point to the urgent need for mental health interventions that center the needs of older Korean Americans.

Mindfulness-based cognitive therapy is a (MBCT) is a group-based intervention rooted in Eastern ideology with a secular curriculum that combines mindfulness training with cognitive therapy.[19] MBCT encourages participants to become more aware of thoughts, emotions, and bodily sensations, and to view them as passing events in the mind.[19] Participants learn skills that involve disengaging from automatic thought patterns related to depression. A variety of studies have demonstrated the effectiveness of MBCT in preventing depression relapse and in reducing active depression. One randomized control trial conducted in England found that MBCT significantly reduced depressive symptoms from moderate to mild among participants in the treatment group, compared to the control group where no change was observed (N=28).[20] Another randomized control trial conducted in Denver, Colorado found that participants in both the MBCT-brief and control group experienced significant and equal reductions in depressive symptoms (N=92). However, the intervention group experienced a gradual symptom reduction over time, whereas the control group a gradual increase in symptoms.[21] In addition, one study in the Netherlands found that MBCT significantly decreased depressive symptoms for participants with and without a current depressive episode (N=205).[22]

While MBCT has been primarily tested among non-Hispanic White populations, there are several studies that point to the promising benefits of mindfulness among Asian populations. A systematic review of mindfulness-based interventions in Asian populations was conducted where researchers identified 40 articles, 33 which were controlled trials, and 7 with a pre-posttest design.[23] Overall, MBCT was effective in reducing depressive symptoms compared to routine treatment methods, or no treatment at all.[23] One pretest-posttest control group study in Thailand found that elderly Thai women who received mindfulness-based cognitive therapy exhibited lower depression scores after the program completion, and 3 months thereafter, compared to those who received typical emotional support and care from nurses (N=54).[24] A randomized control trial in Hong Kong demonstrated that behavioral activation with mindfulness was more effective in reducing depressive symptoms than routine care (N=115).[25] While these are promising results, none of these studies included Asian immigrants from the United States, and the impact of MBCT remains unexplored in this population.

The Current Study

Despite the higher rate of depression among this population, older Korean American adults are not accessing mental health services due to low mental health literacy, language barriers, and stigma.[18] Furthermore, the impact of an MBCT program remains unexplored among older Korean American adults. To address this gap, we partnered with the Asian American Information Network (AARIN), a community-based organization serving older Korean American adults, to implement a culturally adapted, telephone-delivered, mindfulness-based cognitive therapy program (MBCT-brief). MBCT-brief has been shown to improve reach and accessibility of services, as well as be effective in reducing depressive symptoms among mostly white participants.[26]

Methods

Healthy Mind Healthy Living (HMHL) is a single arm, pretest-posttest intervention study to assess the impact of MBCT-brief on depression, sleep quality, and stress for older Korean adults, aged 50-89.

Setting

The current study was delivered in a remote setting, through telephone or HIPAA approved Zoom, depending on the participant's preference. During each session, instructions were provided if any technological issues arose, and a research assistant was present to provide immediate support.

Participant Recruitment and Enrollment

Participants were recruited by AARIN, a community-based organization serving older Asian populations. Participants were recruited through flyers, social media, and word of mouth. AARIN also collaborated with partnering organizations and asked them to refer potential participants who may be interested in the program. Interested individuals provided their contact information to AARIN to receive more information about the study. Next, AARIN called each interested individual to gauge interest and assess eligibility for the study. Participant recruitment and retention are displayed in Figure 1. 36 participants contacted AARIN, 26 participants were eligible to participate, 24 participants enrolled in the program, and 2 participants could not enroll due to their schedule, leading to a resulting enrollment rate of 92%. The study received approval

by the Institutional Review Board at the University of Washington Human Subjects Division in February 2023.

Inclusion criteria for participants included: (1) self-identify as Korean, (2) be between the ages 50 and 89, (3) has limited English proficiency (responds “less than very well” when asked “how well do you speak English”?), (4) has mild to moderate depressive symptoms (scores between 5-14 when assessed using Patient Health Questionnaire-9 (PHQ-9), and (5) willing to give an audio/visual consent to participate in the study. Exclusion criteria included older Korean adults with PHQ-9 scores $\geq$ 15 (moderately severe to severe) as current evidence show that engaging in mindfulness practices that may invite experiencing negative stimuli can increase emotional dysregulation and instability among this group. If eligible for the study, consent information was provided verbally by the participant and recorded online through REDCap by the interviewer. If ineligible, participants were thanked for their time and interest in the study. Participants received up to $120 for participating in this study: $20 for completing each survey ($40 for the pre/post survey), $50 for completing the 8-week MBCT-brief program and an additional $30 for the semi-structured interview.

Intervention

The intervention was delivered in the format of 1-hour sessions over 8 weeks. All sessions were in Korean and facilitated by a trained, licensed clinical therapist bilingual in both Korean and English. The therapist facilitated a total of 3 MBCT-brief groups: 8 participants in Group 1, 10 participants in Group 2, and 6 participants in Group 3. Prior to the start of each group, participants received the program workbook in the mail, which contained the session content, homework assignments, and audio guides to support home practice. Each session was delivered over Zoom where participants could join via Zoom or by calling in through telephone. A research assistant was present at each session to provide administrative and technical support. The format for each session included a check-in, a guided practice specific to that week’s content, an inquiry discussion, and an overview of the assigned weekly practice (Figure 2). The assigned weekly practice involved mindfulness audio recordings for participants to follow at home daily. Audio recording links were sent to participants via email and text after each session by the research team. Additionally, each session was recorded and sent to participants who missed a specific session. Participants were asked to communicate absences in advance and were only permitted to miss 2 sessions to remain in the program. Among the 24 participants who enrolled in Healthy Mind Healthy Living study, 1 participant dropped out of the program

after the first session. Including this participant, the average attendance for the 8 total sessions was 6.83.

Prior to implementation, the original MBCT-brief was culturally and linguistically adapted by the research team, community partners, and intervention developers for the older Korean American community using the Framework for Reporting Adaptations and Modifications – Enhanced (FRAME).[27] FRAME provides a framework to document and characterize modifications made to adapted evidence-based interventions. Modifications are classified by who the modification was made for, what was modified, the level of delivery, and the context and nature of the modification (Figure 3). First, the participant workbook was reviewed by the bilingual and bicultural research team and community partners to identify content areas needing cultural adaptations. Recommended adaptations were presented to the intervention developers for fidelity to the original intervention. Intervention developers provided alternative options if modifications compromised fidelity. When all modifications were finalized, the workbook was translated into Korean by a professional translator. After translation, the researchers and community partners reviewed the adapted workbook and made minor revisions to improve the flow and appropriateness of the workbook. Some examples of adaptations included: removing examples considered taboo in the community (e.g., alcohol and drugs), replacing discussion topics with age-appropriate scenarios, and replacing “fork” with “chopsticks.” Furthermore, due to the awkward translation of MBCT-brief to the Korean language, the program name was changed to “Healthy Mind Healthy Living” to increase acceptability among the Korean community.

Data Collection

Data collection was conducted from May 2023 to December 2023. Eligible participants completed the baseline survey, administered by a bilingual team member. After the participation in the 8 week MBCT program, participants were contacted by a bilingual team members to complete the postsurvey. All surveys were administered by the team member in Korean over the phone. 24 participants completed the baseline survey and 22 participants the postsurvey (91.67% completion rate).

Measures

Depression

The primary outcome variable was depression. Depression was measured using the 16-item Quick Inventory of Depressive Symptomatology (QIDS-SR_{16}) a standardized, validated measure, used to measure depressive symptom severity.[28] Depression included 9 domains: 1) sad mood, 2) concentration, 3) self-criticism, 4) suicidal ideation, 5) interest, 6) energy/fatigue, 7) sleep disturbance, 8) appetite/weight, and 9) psychomotor agitation/retardation. Questions under each domain had several answer choices. For example, when asked about the concentration domain, the participant could indicate the following: 1) There is no change in my usual capacity to concentrate or make decisions, 2) I occasionally feel indecisive or find that my attention wanders, 3) Most of the time, I struggle to focus my attention or to make decisions, or 4) I cannot concentrate well enough to read or cannot make even minor decisions. For each of the nine domains, the scores ranged between 0-3 (0 = lowest, 3 = highest). The total QIDS scores ranged from 0 to 27 with scores of 5 or lower indicative of no depression, scores from 6 to 10 indicating mild depression, 11 to 15 indicating moderate depression, 16 to 20 reflecting severe depression, and total scores greater than 21 indicating very severe depression.

Sleep Quality

Sleep quality was measured with the Adult Patient Reported Outcomes Measurement Information System (PROMIS) Short Form v1.0 – Sleep Disturbance 4a. The PROMIS instrument is a valid and reliable measure that evaluates self-reported perceptions of sleep quality, sleep restoration, and sleep depth, as well as challenges with falling or staying asleep.[29] The 4-items are rated on a 5-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The total scores range from 4 to 20 with higher scores indicating greater sleep disturbance. Raw total scores are converted to T-scores. A T-Score of 50 represents the mean of the United States population with a standard deviation of 10. As a result, a higher T-Score than 50 indicates greater sleep disturbance than the average U.S. population.

Immigrant Stress

Stress was measured with the Perceived Stress Scale, a widely used instrument to measure perception of stress.[30] The measure assess stress levels and how often participants felt a particular way in the last month, such as how unpredictable or uncontrollable they perceived their life to be. The 10 items are rated on a 5-point scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often). All scores were added to create a total immigrant stress. Higher scores mean increased stress. Questions 4, 5, 7, and 8 were first

reversed coded. Individual scores ranged from 0 to 40 with higher scores indicating greater perceived stress. Scores ranged from 0-13 (low stress), 14-26 (moderate stress), and 27-40 (high perceived stress).

Participant Satisfaction Questionnaire

During the administration of the postsurvey, participants also completed the Participation Satisfaction Questionnaire (PSQ). The PSQ is a 15-item survey adapted from the Client Satisfaction Questionnaire, a widely used survey to measure client satisfaction in receiving services.[31] The language of the questions was modified to be applicable towards participants in the HMHL program. Questions were also added to ask directly about the perceived appropriateness and acceptability of the program among the Korean community.

Sociodemographic Variables

Sociodemographic variables were measured at baseline. Measures included age, gender, employment status, marital status, English proficiency, education level, and household income.

Data Analysis

Data were analyzed using the statistical software, R.[32] Descriptive analyses generated frequencies for categorical variables and means for continuous variables. Depression, sleep quality, and stress scores were calculated following the scoring systems described above. A paired t test was used to test the null hypothesis that the difference in means for the outcome variables is zero. A per-protocol analysis approach was applied, that is, only people who completed both the baseline and post intervention surveys were included. The study excluded 2 people because they did not complete the post intervention survey. We used alpha at 0.05 to test for significance.

Results

Participant Characteristics

Figure 4 portrays the demographic characteristics of the participants. The average age of participants was 62 and the age range was 51-82 years. 87.5% of participants identified as woman and 12.50% identified as man. A quarter of participants (25%) were retired and over half reported working either full-time or part-time (58%). Most participants were married or in a

marriage-like relationship (67%) and indicated limited English proficiency (76%). Over half hold a college degree (70%) and almost half reported an income of less than $50,000 (46%).

Impact of HMHL on Depression

We found a decrease in depression from pre to post intervention. The posttest scores (M = 8.23, SD = 4.86) were significantly lower than the pretest scores (M = 10.68, SD = 4.18), t(21) = 2.92, p = 0.004 (Figure 5).

Impact of HMHL on Sleep Quality

For the secondary outcome variable, sleep quality, there was an increase in sleep quality from pre to post intervention. The post intervention scores (M = 51.17, SD = 2.89) were significantly higher than the pre intervention scores (M = 53.57, SD = 4.14), t(21) = 2.55, p = 0.009 (Figure 6).

Impact of HMHL on Immigrant Stress

There was a decrease in perceived stress levels from pre (M = 17.68, SD = 4.78) to post intervention (M = 17.32, SD = 4.15), t(21) = 0.28, p = 0.39 (Figure 7). This reduction was not statistically significant.

Participant Satisfaction Questionnaire

Responses to the patient satisfaction questionnaire are displayed in Figure 8. Across all three groups, over half of participants indicated that their expectations were somewhat met and about 30% indicated that their expectations were mostly or entirely met. Almost all participants report that HMHL helped them manage their stress and depressive symptoms to some extent. About 82% indicated that they are ‘mostly to completely’ satisfied with HMHL. Over half of the participants reported that they were ‘mostly to completely’ satisfied with the delivery of the program over the phone. Regarding the program content, about 82% of participants found the weekly homework assignments to be ‘mostly to completely’ beneficial, and 54% found the workbook to be ‘mostly to completely’ understandable. Lastly, 77% found HMHL to be mostly to completely appropriate for the Korean American community, and 63% found HMHL to be mostly to completely acceptable for the Korean American community.

There were group differences in satisfaction. Group 3 responses were on the higher end of the scale (3-4) indicating a more positive response to the HMHL intervention, compared to Groups 1 and 2 which scored relatively lower on the scale (1-2) compared to Group 3 (Figure 5). For example, when asked “To what extent has HMHL met your expectations,” the majority of participants in Group 1 (57.14%) and Group 2 (77.79%) selected “2 = some of my expectations were met,” whereas the majority of participants in Group 3 (66.67%) selected “3 = Most of my expectations were met.” Similarly, when asked “How has the HMHL program helped you manage your stress effectively, the majority of participants in Group 1 (80.70%) and in Group 2 (66.67) reported “2 = it helped somewhat” while participants in Group 3 reported “3 = it mostly helped” (50%) or “4 = it helped a great deal” (50%).

Discussion

This study examined the impact of a culturally and linguistically adapted MBCT-brief intervention on depression, sleep quality, and stress among older Korean American adults aged 50-89 in the United States. Participation in a brief culturally and linguistically adapted MBCT intervention showed significant reduction in depression and increased sleep quality among Korean Americans. While there was also a reduction in stress, it was not statistically significant.

Our findings corroborate previous studies that show the effectiveness of MBCT in reducing depression among non-Hispanic White populations[20-22] and populations in Asian countries.[23-25] While this is the first study to test an MBCT-brief program for older Korean Americans, it demonstrates the importance of tailoring interventions to be culturally and linguistically appropriate for specific communities. By reducing the language barrier and adapting the content for Korean Americans, participants were able to learn mindfulness tools in their native language and engage in supported conversations about stress and anxiety without stigma.

The study also found improvements in sleep quality among participants. Numerous studies have shown the strong association between depression and sleep, with sleep disturbance being one of the main symptoms of depression.[33] As a result, it is plausible that we observe the improvement of sleep in tandem with depression due to their strong association. Furthermore, all HMHL sessions occurred in the evening, which may have contributed to helping participants to be relaxed after the sessions, aiding them with sleep quality. Similarly, as most participants were working during the day, they may have completed the at-home

mindfulness exercises in the evening, naturally preparing them to be more ready to the cognitive therapy.

The study observed a reduction in stress; however, it was not statistically significant. There are several possible reasons for this finding. First, the small sample size of 22 participants may have been underpowered to detect a significant difference of 0.36 points. Secondly, there is a lack of validity around the measure of perceived stress among older Korean Americans. While the Korean version of this scale has been tested and validated among the younger Korean American population[34,35] and older Koreans residing in South Korea[36], it has not been formally tested among the older Korean American population. Third, some of the measures may not have been a candidate for improvement with MBCT. For example, when the two subscales[37] under the Perceived Stress Scale are examined more carefully, the items in the scale associated with self-efficacy tended to result in greater reductions in stress levels whereas the items associated with helplessness tended to result in greater increases in stress levels. It may be that MBCT may be helpful for increasing self-efficacy rather than decreasing perceived helplessness. Furthermore, Korean cultural norms discourage individual expressions of emotional stress and emphasize diligence as a social virtue.[38] As a result, many Korean Americans cope with their stress through problem-focused coping strategies, such as being diligent, exercising, and engaging in hobbies.[39] Further studies may be needed to provide a deeper understanding of how stress is conceptualized and perceived by older Korean Americans.

We also sought to learn about participants' experiences in the program through the Participant Satisfaction Questionnaire. We found that participant satisfaction improved through the course of the study. While there was an overall positive response to the program, Group 3 tended to have more positive responses to each question than Groups 1 and 2. There are various reasons as to why we may see these results. The first two groups were launched simultaneously, and it was the first time for the facilitator to lead an MBCT-brief program. During weekly debriefs with the facilitator, she expressed that there was a learning curve for her and described how her confidence and ability to explain concepts was growing with each session. By the time Group 3 had begun, the facilitator had a better grasp on how to explain mindfulness concepts in a way that resonated with participants. Secondly, for the first two groups, the orientation session and first session were combined to align with the 8-week structure of the MBCT-brief program. However, some participants in Groups 1 and 2 expressed that they were not expecting the program to be primarily focused on mindfulness exercises and skills-building.

To make program expectations clearer, we created a separate orientation session for Group 3 where participants openly asked questions and were provided greater detail of what to expect from the program. As a result, Group 3 participants were more informed and better prepared to engage with the program material. Through this experience, we learned the importance of having a separate orientation session so that participants can ask questions, process, and mentally prepare for the program before diving into the first session.

The study had various limitations and strengths. First, our study did not have a control group, limiting our ability to attribute the effects observed to the intervention alone. Second, the study included a small sample size of 24 participants, who were mostly from New York and New Jersey. Many of the participants reside in ethnic enclaves and may experience protective factors associated with having a community of a similar ethnic background. These two states are within the top five states with the greatest Asian populations, so the findings may not be generalizable to Korean Americans living in other states with a small Korean population.

This study also had many strengths. First, this was the first culturally and linguistically adapted MBCT-brief intervention for older Korean American adults. All materials were culturally adapted, translated, and reviewed by Korean research staff and community partners. We used reliable and tested Korean versions of the primary measures to assess depression, sleep quality, and stress. As this was a pilot study, we took note of areas to improve and adapt the materials for future iterations. To address limitations, future research studies should explore the impacts of MBCT-brief among older Korean adults using a large scale, randomized control trial design.

Conclusion

Overall, this study found that culturally and linguistically adapted MBCT-brief for older Korean American adults improved depression, sleep quality, and stress among this community. On average, participants were satisfied with the program, perceived it to help manage stress and depression, and found the program to be culturally acceptable and appropriate for the Korean American community. This study reveals valuable information about the potential of MBCT-brief for the Korean American older adults, as well as other Asian communities with limited English proficiency. Barriers related to language, stigma, and a lack of culturally appropriate mental health services may be mitigated by programs like Healthy Mind Healthy Living. While MBCT-brief was tailored for older Korean Americans, future intervention studies

may consider partnering with community-based organizations serving other Asian populations to adapt the program culturally and linguistically for their specific community. Continuing to adapt and assess evidence-based mental health interventions for older Asian communities is critical in reducing depression and advancing health equity for all.

Figures

Figure 1. CONSORT Diagram

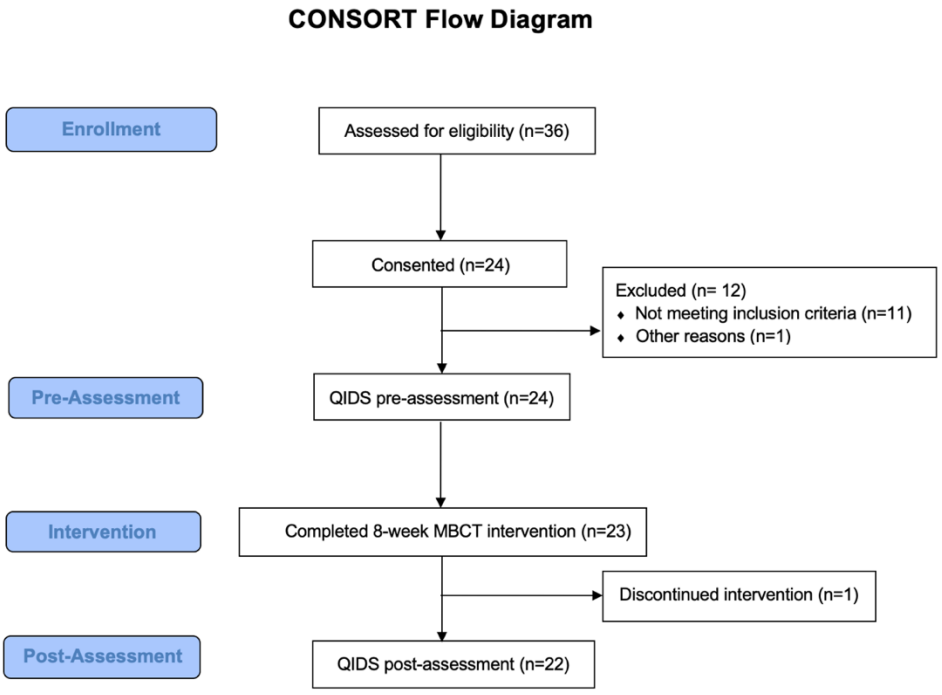


Figure 2. MBCT-brief Structure and Content

Session Structure	Weekly Content of MBCT-brief
1) Homework review (except for first session) 2) In-session practice of mindfulness exercises 3) Guided inquiry 4) Summary of main themes Daily mindfulness exercises (via audio recordings) assigned for home practice	1. Awareness of Automatic Pilot
	2. Living in Our Heads
	3. Gathering the Scattered Mind
	4. Thoughts Are Not Facts
	5. Allowing and Letting Be (Part I)
	6. Allowing and Letting Be (Part II)
	7. Taking Care of Myself

	8. Maintenance

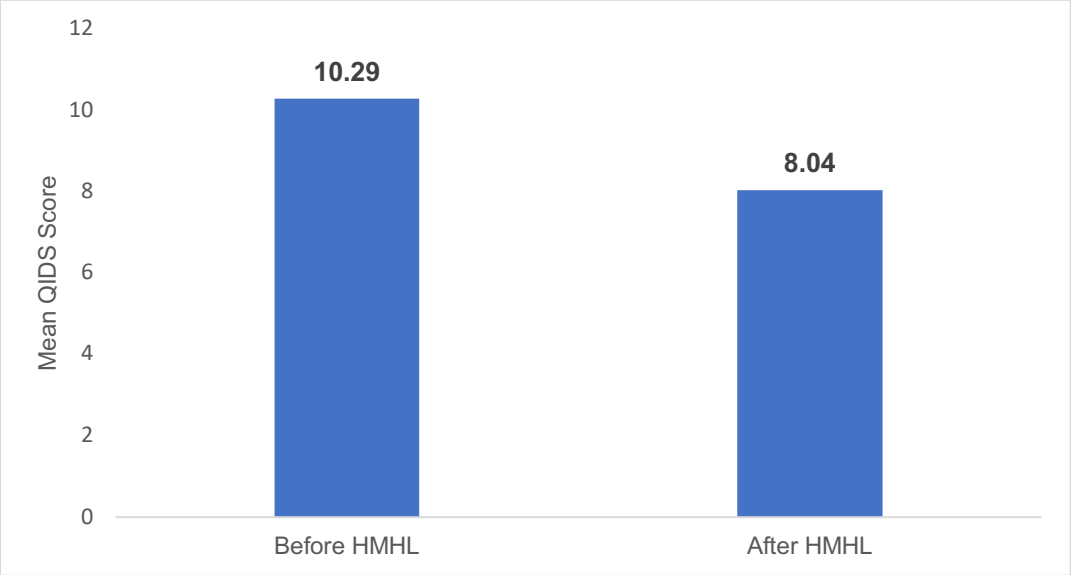
Figure 3. Cultural and Linguistic Adaptations of MBCT-brief Using FRAME

Categories	N	%	Example of adaptation
What was modified			
Content	19	95	Changed "Studying for an exam or preparing a work presentation" to "Hosting a family gathering"
Context	1	5	Developed Q&A session prior to the first session for group 3*
Who made the recommendation and decision			
All (Researcher/Community Partner/Intervention Developer/ Service Provider)	15	75	Changed "We are uncertain how a presentation will go at school" with "We are uncertain about our financial situation for the future"
Researcher/Community Partner/Service Provider	3	15	Translated the content to Korean language
Researcher/Community Partner	2	10	Replaced all images with culturally relevant images
When implementation was made			
Pre-implementation	18	90	Changed "using fork" with "eating with chopstick"
Pilot implementation	2	10	Explanation of the difference between mindfulness and meditation in group 3*
Whether modification was planned			
Planned (proactive adaptation)	18	90	Lesson on Stress, Distress, & Mindfulness: examples of stress were culturally and age appropriate
Unplanned (reactive adaptation)	2	10	Developed Q&A session prior to the first session for group 3*
Fidelity			
Fidelity-consistent	20	100	Deleted "meditation group or having a friend be your meditation buddy" and replaced with “consider practicing the mindfulness skills and the different techniques you learned during this time with a friend or a family member."
Level of Delivery			
Entire target group	18	90	Removed "alcohol or drug use" under "What is Stress?" section due to stigma
Specific target group	2	10	Explanation of the difference between mindfulness and meditation in group 3*
Why modification was made			
To improve fit AND increase reach/engagement	1	5	Changed program name from Mindfulness-Based Cognitive Therapy to Healthy Mind Healthy Living
To improve fit	16	80	Examples of stress were culturally and age appropriate
To increase reach/engagement	3	15	Replaced all images with culturally relevant images

Figure 4. Participant Demographic Characteristics

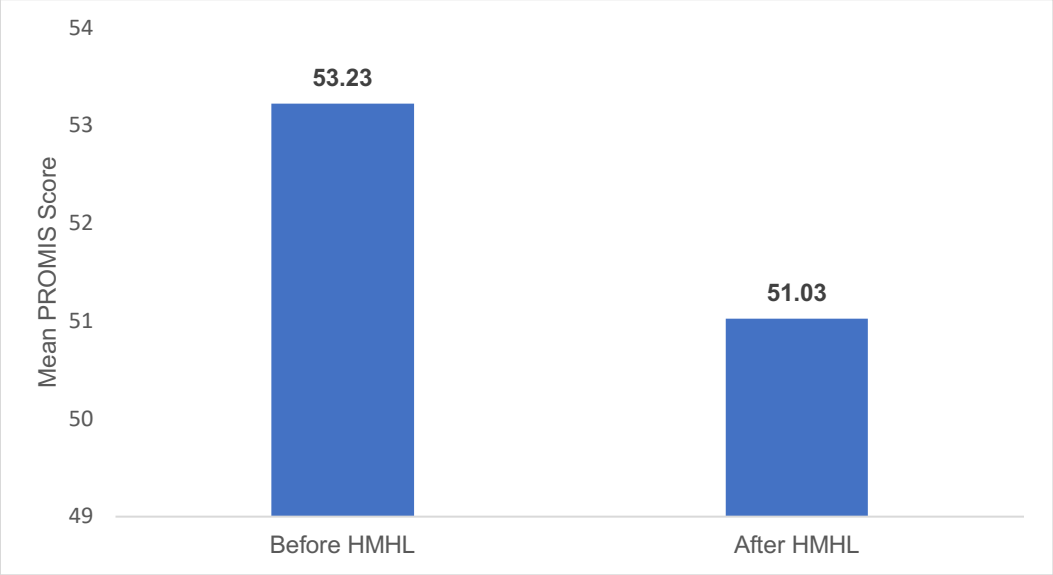
Participant Demographics (N=24)	
Variable	**N (%)**
Age, mean (SD)	60.58 (8.95)
Gender	
Man	3 (12.50)
Woman	21 (87.50)
Marital Status	
Single	1 (4.17)
Married	16 (66.67)
Divorced	5 (20.83)
Widowed	1 (4.17)
Prefer not to answer	1 (4.17)
English Fluency	
Not at all	15 (62.50)
Not well	2 (8.30)
Well	7 (29.16)
Employment Status	
Full Time	9 (37.50)
Part Time	5 (20.83)
Retired	6 (25)
Unemployed	2 (8.33)
Not applicable	2 (8.33)
Education	
High school graduate	2 (8.33)
Some college	3 (12.50)
Associate degree	2 (8.33)
College graduate	13 (54.17)
Graduate school degree	4 (16.67)
Household Income	
Less than $15,000	3 (12.50)
$15,000 to less than $35,000	7 (29.17)
$35,000 to less than $50,000	1 (4.17)
$50,000 to less than $75,000	1 (4.17)
$75,000 to less than $100,000	3 (12.50)
$100,000 to less than $150,000	4 (16.67)
$150,000 or more	5 (20.83)

Figure 5. Impact of HMHL on Depression



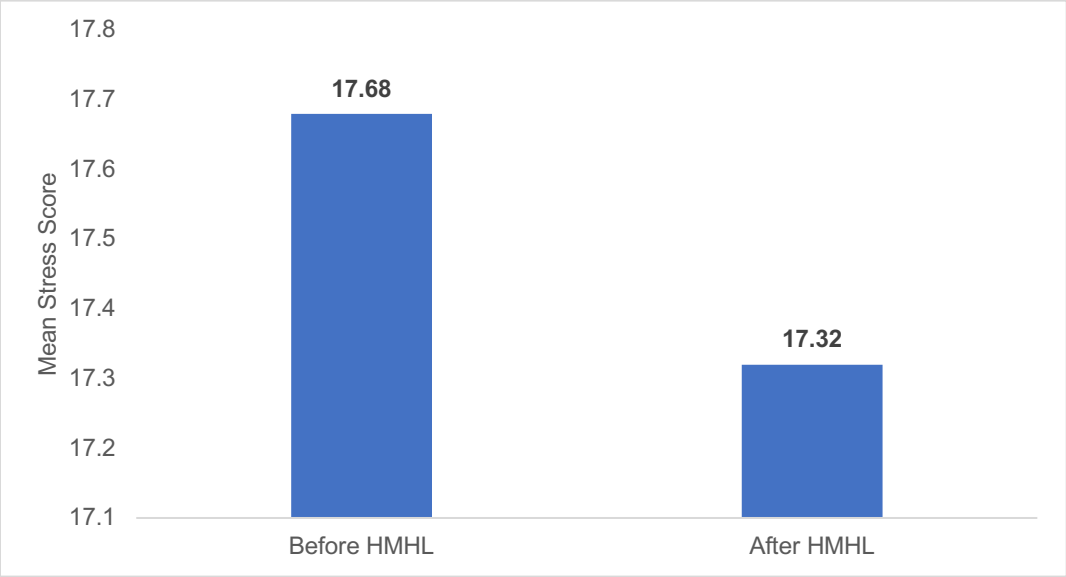
N = 22, $t(21) = 2.92$, $p < 0.004$

Figure 6. Impact of HMHL on Sleep Quality



N = 22, $t(21) = 2.55$, $p < 0.009$

Figure 7. Impact of HMHL on Stress



N = 22, t(21) = 0.28, p = 0.39

Figure 8. Participant Satisfaction Questionnaire

Question	Response Items	All Groups (N=22)	Group 1 (n=7)	Group 2 (n=9)	Group 3 (n=6)
		n (%)	n (%)	n (%)	n (%)
To what extent has the Healthy Mind Healthy Living (HMHL) program met your expectations?	1, None of my expectations have been met	2 (9.00)	2 (28.67)	0 (0)	0 (0)
	2, Some of my expectations have been met	13 (59.00)	4 (57.14)	7 (77.79)	2 (33.33)
	3, Most of my expectations have been met	6 (27.27)	1 (14.28)	1 (11.11)	4 (66.67)
	4, All of my expectations have been met	1 (4.54)	0 (0)	1 (11.11)	0 (0)
How has the HMHL program helped you manage your stress effectively?	1, It did not help at all	0 (0)	0 (0)	0 (0)	0 (0)
	2, It helped somewhat	12 (54.54)	6 (85.70)	6 (66.67)	0 (0)
	3, It mostly helped	5 (22.72)	0 (0)	2 (22.22)	3 (50.00)
	4, It helped a great deal	5 (22.72)	1 (14.28)	1 (11.11)	3 (50.00)
How has the HMHL program helped you manage your	1, It did not help at all	1 (4.54)	1 (14.28)	0 (0)	0 (0)

depressive symptoms effectively?					
	2, It helped somewhat	11 (50.00)	5 (71.43)	5 (55.56)	1 (16.67)
	3, It mostly helped	5 (22.72)	0 (0)	2 (22.22)	3 (50.00)
	4, It helped a great deal	5 (22.72)	1 (14.28)	2 (22.22)	2 (33.33)
Overall, how satisfied are you with the HMHL program?	1, Very dissatisfied	1 (4.54)	1 (14.28)	0 (0)	0 (0)
	2, Somewhat satisfied	3 (13.63)	1 (14.28)	2 (22.22)	0 (0)
	3, Mostly satisfied	13 (59.09)	4 (57.14)	5 (55.56)	4 (66.67)
	4, Completely satisfied	5 (22.72)	1 (14.28)	2 (22.22)	2 (33.33)
How satisfied are you with the program being implemented over the phone and video?	1, Very dissatisfied	3 (14.28)	1 (14.28)	2 (22.22)	0 (0)
	2, Somewhat satisfied	5 (23.80)	4 (57.14)	1 (11.11)	0 (0)
	3, Mostly satisfied	9 (42.85)	2 (28.67)	5 (55.56)	2 (33.33)
	4, Completely satisfied	4 (19.04)	0 (0)	0 (0)	4 (66.67)
How beneficial were the weekly homework assignments?	1, Not at all beneficial	1 (4.54)	1 (14.28)	0 (0)	0 (0)
	2, Somewhat beneficial	7 (31.81)	3 (42.86)	4 (44.44)	0 (0)
	3, Mostly beneficial	9 (40.90)	3 (42.86)	3 (33.33)	3 (50.00)
	4, Completely beneficial	5 (22.72)	0 (0)	2 (22.22)	3 (50.00)
How understandable was the workbook?	1, Not at all understandable	1 (4.54)	1 (14.28)	0 (0)	0 (0)
	2, Somewhat understandable	9 (40.90)	3 (42.86)	5 (55.56)	1 (16.67)
	3, Mostly understandable	10 (45.45)	3 (42.86)	4 (44.44)	3 (50.00)
	4, Completely understandable	2 (9.00)	0 (0)	0 (0)	2 (33.33)
How effective was the facilitator at delivering the weekly sessions?	1, Not at all effective	0 (0)	0 (0)	0 (0)	0 (0)
	2, Somewhat effective	4 (18.00)	3 (42.86)	1 (11.11)	0 (0)
	3, Mostly effective	11 (50.00)	2 (28.67)	6 (66.67)	3 (50.00)
	4, Completely effective	7 (31.81)	2 (28.67)	2 (22.22)	3 (50.00)
How would you rate the appropriateness of the HMHL program for the Korean American community?	1, Not at all appropriate	1 (4.54)	1 (14.28)	0 (0)	0 (0)
	2, Somewhat appropriate	4 (18.00)	1 (14.28)	3 (33.33)	0 (0)
	3, Mostly appropriate	7 (31.81)	3 (42.86)	3 (33.33)	1 (16.67)
	4, Completely appropriate	10 (45.45)	2 (28.67)	3 (33.33)	5 (83.33)
How would you rate the acceptability of the HMHL program by the Korean American community?	1, Not at all acceptable	3 (13.63)	1 (14.28)	2 (22.22)	0 (0)
	2, Somewhat acceptable	5 (22.72)	3 (42.86)	2 (22.22)	0 (0)
	3, Mostly acceptable	11 (50.00)	3 (42.86)	5 (55.56)	3 (50.00)
	4, Completely acceptable	3 (13.63)	0 (0)	0 (0)	3 (50.00)
How did you feel about the amount of guided instruction	1, Too little	2 (9.00)	1 (14.28)	1 (11.11)	0 (0)

you received for the meditation exercise?					
	2, Right amount	15 (68.18)	4 (57.14)	5 (55.56)	6 (100.00)
	3, Too much	5 (22.72)	2 (28.67)	3 (33.33)	0 (0)
How likely are you to recommend the HMHL program to a friend or a family member?	1, Very unlikely	0 (0)	0 (0)	0 (0)	0 (0)
	2, Somewhat unlikely	1 (4.54)	1 (14.28)	0 (0)	0 (0)
	3, Somewhat likely	7 (31.81)	3 (42.86)	4 (44.44)	0 (0)
	4, Very likely	14 (64.00)	3 (42.86)	5 (55.56)	6 (100.00)

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