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RESEARCH ARTICLE

A mindfulness-based multicomponent caregiver intervention (PAACC): objectives, study design, and cohort description

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Abstract

INTRODUCTION: Effective interventions are needed to reduce caregiver burden and stress, particularly among family caregivers of veterans with dementia. Unique risk factors such as traumatic brain injury (TBI) and post-traumatic stress disorder (PTSD) further complicate caregiving. This study compares a four-session mindfulness-based multicomponent intervention (PAACC) with a cognitive behavioral intervention (REACH), both designed to alleviate caregiver burden, and provides a baseline evaluation of caregivers in the intervention. A two-arm, blinded, randomized controlled trial assigned 133 dementia caregivers to PAACC (n = 67) or REACH (n = 66). Baseline assessments included caregiver stress, burden, mindfulness receptivity, rumination, compassion, depressive symptoms, anxiety, and care recipient behavior. Participants averaged 67.17 years, 85% were women, and 70% were spousal caregivers. Caregivers in PAACC reported higher depressive symptoms and anxiety and lower mindfulness receptivity. This study introduces the first mindfulness-based intervention for veteran caregivers, designed to enhance cognitive flexibility, cultivate compassion, and provide practical skills to improve quality of life.

METHODS: The study utilized a two-arm, blinded, prospective randomized controlled trial to compare the PAACC and REACH interventions. A total of 133 dementia caregivers experiencing moderate to severe caregiver burden were assigned to receive either the PAACC intervention (n = 67) or the REACH intervention (n = 66). Baseline evaluations included caregiver stress, burden, mindfulness receptivity, rumination, compassion, depressive symptoms, anxiety, and the memory and behavior problems of the veteran living with dementia, using widely accepted measures from caregiving literature.

RESULTS: Baseline assessments were conducted on 133 family caregivers of veterans living with dementia. The average caregiver age was 67.17 years (SD = 9.8), 85% were women, and 70% were spousal caregivers. No significant demographic differences were found between the two intervention groups. However, baseline comparisons showed that caregivers in the PAACC intervention reported higher depressive

symptoms and anxiety, and lower mindfulness receptivity. A detailed protocol for the mindfulness-based multicomponent caregiver intervention PAACC is described.

DISCUSSION: There is a growing need for multicomponent, skill-building interventions tailored for dementia caregivers who are at high risk of stress. This study introduces the first mindfulness-based intervention specifically for caregivers of veterans, designed to enhance cognitive flexibility, cultivate compassion, and equip caregivers with practical skills to improve their quality of life.

KEYWORDS
dementia, family caregiver, intervention, mindfulness

Highlights

- PAACC is a mindfulness-based multicomponent intervention for dementia caregivers of veterans.
- No demographic differences suggest psychological differences are not due to demographics.
- Baseline mental health and mindfulness readiness may impact intervention effectiveness.

1 | BACKGROUND

More than 6.9 million Americans aged 65 and older currently live with Alzheimer's disease (AD) or other forms of dementia. Without breakthroughs to prevent, slow, or cure AD, that number is projected to rise to 13.8 million by 2060.[1] By 2024, health and long-term care costs related to dementia may reach US$360 billion, not including the value of unpaid caregiving.[1]

Veterans, who make up a significant portion of those affected, face even greater risks. In 2022, more than 451,000 veterans were living with AD, and over 130,000 new cases were diagnosed each year.[2] The U.S. Department of Veterans Affairs (VA) anticipates a 22% increase in veterans living with AD by 2033.[2] Risk factors such as traumatic brain injury (TBI), post-traumatic stress disorder (PTSD), and depression further elevate veterans' likelihood of dementia,[3] often leading to longer hospital stays, more frequent psychiatric visits, and increased need for nursing home care.[4]

AD is a progressive neurodegenerative condition that impairs cognitive function and behavior, frequently resulting in a loss of independence for persons living with dementia (PLWDs). About 80% of PLWDs receive care from family members, many of whom provide over 8 h of support daily.[1] These caregivers manage a wide range of responsibilities – from complex tasks like managing finances and medications to assisting with basic personal activities such as bathing and dressing.

Beyond these physical caregiving duties, family caregivers commonly contend with challenging behavioral and psychological symptoms (e.g., aggression, confusion), which intensify stress and burden. A meta-analysis found that dementia caregivers experience higher levels of stress, depression, and physical health issues (including hypertension) compared to those caring for relatives without dementia.[5] Another longitudinal study found that within 2 years, up to 37% of dementia caregivers develop major depressive disorder and 55% experience anxiety.[6] Moreover, caregivers who provide higher amounts of care feel more stressed or burned out[7] and are more inclined to consider placing their relative in long-term care prematurely, a decision that can lead to heightened guilt and depression.[8]

Caregivers provide care for various reasons, including love, reciprocity, spiritual fulfillment, duty, guilt, and social pressure. Those motivated primarily by obligation or guilt report greater psychological distress than caregivers with more positive motivations.[9] As the population of veterans living with AD and TBI-related dementias continues to grow, there is a pressing need for evidence-based interventions aimed at improving the quality of life of veterans' caregivers and reducing caregiver burden, especially within this high-risk population.

1.1 | Existing caregiver interventions

Over the past few decades, numerous caregiver-focused interventions have been developed and tested through randomized controlled trials (RCTs), yet few have been adopted for widespread use.[10] Interventions that incorporate multiple components, such as social support, education, behavioral management, skill building, problem solving, and cognitive behavioral strategies, have proven most effective in reducing caregiver stress, delaying nursing home admission, and improving the PLWD's quality of life.[11,12] One such intervention is the cognitive–behavior therapy-based Resources for Enhancing Alzheimer's Caregiver Health (REACH) program,

which provides didactic instruction, role play, problem solving, skills training, stress management techniques, and telephone support. Through cognitive restructuring, caregivers learn strategies to manage troublesome dementia-related behaviors by reframing negative emotional responses.[13] Adapted for implementation in the nationwide VA healthcare system, REACH-VA has demonstrated success in decreasing caregiver burden, depression, and frustration.[13]

Nevertheless, caregivers often struggle to manage PLWDs' behavioral challenges, leading to rapid, reactive responses in stressful moments. Over time, this cycle of frustration and emotional reactivity can increase guilt and burnout and negatively affect caregivers' health, while also increasing tension in their relationships with PLWDs. This cyclical pattern can become a feedback loop that many caregivers find difficult to break. Interventions must therefore offer caregivers tools to recognize their emotional reactivity to stressors and foster compassion toward themselves and PLWDs.[14]

1.2 | Mindfulness-based approaches

Mindfulness, as defined by Jon Kabat-Zinn, is the practice of cultivating non-judgmental awareness in the present moment.[15] Both formal practices (e.g., breathing meditation) and informal practices (e.g., integrating mindfulness into daily tasks) promote a curious, accepting, and compassionate outlook.[16] Mindfulness-based interventions (MBIs), including Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy,[17] have been widely recognized for their capacity to reduce stress and improve mental health.

A growing number of meta-analyses and systematic reviews underscores the effectiveness of MBIs for dementia caregivers, demonstrating improvements in quality of life and sleep, alongside reductions in burden, depression, anxiety, and perceived stress.[18–20] However, these studies have rarely examined the effectiveness of mindfulness training combined with caregiver-skills training, nor have they focused on caregivers of veterans living with dementia who often experience high levels of burden. Given the unique stressors faced by this population, it is crucial to investigate whether a mindfulness-integrated approach can yield more pronounced outcomes in reducing caregiver burden and improving overall well-being.

1.3 | Mindfulness versus cognitive–behavioral therapy in dementia caregiving

Both mindfulness-based and cognitive–behavioral therapies (CBT) aim to increase awareness of thoughts and feelings, yet they differ fundamentally in how these thoughts and feelings are addressed. CBT posits that stress stems in part from irrational or maladaptive thought patterns and places emphasis on how information is appraised.[21] By replacing unrealistic or illogical beliefs with rational ones and incorporating behavioral activation (e.g., engagement in pleasant events), CBT seeks to reduce distress and maladaptive coping. REACH-VA, which follows a CBT orientation, highlights cognitive restructuring and engaging in healthy behavior planning to lower caregiver burden. Its four core sessions cover dementia education, stress reduction techniques, identification of problem behaviors in PLWDs, and the development of behavioral modification plans alongside personal cognitive restructuring strategies.

Mindfulness approaches, in contrast, foster non-judgmental acceptance of moment-to-moment experiences – thoughts, emotions, or bodily sensations – without trying to change or replace them. In caregiving contexts, where stressors are frequently progressive and not easily altered, mindfulness may be particularly useful. It can help caregivers re-perceive their stressors in a more compassionate, accepting manner, reduce ruminative thinking, and cultivate empathy toward themselves and the PLWDs.[22] By teaching skills to disengage from habitual, automatic, dysfunctional, or ruminative thoughts, mindfulness may lower stress arousal, improve self-efficacy, and promote acceptance – all of which could reduce caregiver stress and enhance the quality of life for both caregivers and PLWDs. This mechanism differs from CBT's focus on challenging irrational cognition. Through present-moment awareness, mindfulness-based strategies may also promote cognitive flexibility, potentially enabling more skillful application of existing caregiver techniques.

RESEARCH IN CONTEXT

1. **Systematic review**: We conducted a systematic review using databases such as PubMed, focusing on caregiver interventions and mindfulness-based approaches. This review synthesizes evidence for the efficacy of these interventions in enhancing caregiver well-being and managing stress.
2. **Interpretation**: To our knowledge, PAACC is the first mindfulness-based multicomponent intervention designed for veteran families living with dementia. This paper details the study's design, provides a comparative overview of PAACC and REACH-VA interventions, and presents the baseline characteristics of the caregiver participants.
3. **Future directions**: Demographic characteristics were comparable across groups, baseline differences were observed in depressive symptoms, anxiety, and mindfulness receptivity. These findings underscore the need to assess caregivers' psychological readiness when implementing interventions. While this paper emphasizes study design and participant characteristics, the initial differences set the stage for future analyses, making it critical to evaluate how baseline mental health and mindfulness receptivity influence the PAACC intervention's effectiveness of caregiver well-being.

1.4 | The PAACC intervention: integrating mindfulness with skills-training

To address gaps in current interventions, we developed the Practice of Acceptance, Awareness, and Compassion in Caregiving (PAACC) intervention. While it retains core dementia education and problem-solving components of REACH-VA, PAACC uniquely integrates structured mindfulness exercises – including mindful eating, mindful breathing, loving kindness, RAIN meditation (**R**ecognize when a emotion or experience is happening, **A**llow the experience to be there as it is – without suppressing it, **I**nvestigate the experience on one's body, emotions, and thoughts with kindness, interest and curiosity, **N**atural awareness, which comes with not identifying with the sensation, emotions, or thoughts, reminding oneself that these aspects of one's experience are fleeting – they do not define who you are); STOP meditation (**S**top what you are doing to pause, **T**ake a Breath to center oneself, **O**bserve one's thoughts/feelings/urges/sensations, **P**roceed with intention, choosing one's next action mindfully); and informal mindfulness practice as homework assignments. By teaching caregivers to become more aware of their stress responses in real time, accept experiences without harsh judgment, and cultivate compassion for themselves and PLWDs, the PAACC intervention aims to reduce reactivity, lessen caregiver burden, and foster a more supportive caregiving environment.

A key innovation of PAACC is its integration of mindfulness training with practical caregiver skills. In addition to individualized dementia education and behavior management strategies, PAACC provides formal instruction in the cultivation of present-moment awareness. This approach enhances cognitive flexibility, allowing caregivers to apply new caregiving skills more effectively during stressful moments, thereby reducing overall caregiver burden.

PAACC is delivered in four core sessions, each focusing on dementia education, stress reduction through mindfulness exercises, behavioral management, and ongoing mindfulness practice to encourage acceptance and compassion toward PLWDs. Every session includes at least one structured mindfulness exercise and home practice assignments that reinforce both formal (guided exercises) and informal (moment-to-moment) techniques. Thus, the goal of PAACC is to empower caregivers with mindful presence and compassion needed to navigate daily challenges, improving both their own well-being and the quality of care they provide.

1.5 | Rationale for study

MBIs have shown promise in reducing caregiver burden, depression, and anxiety.[23,24] However, few programs have integrated mindfulness techniques with traditional caregiver-skills training for family caregivers of veterans living with dementia, who often contend with additional challenges such as co-existing PTSD or TBI. To address this gap, we propose a head-to-head comparison of PAACC (mindfulness-based + skills training) and REACH-VA (CBT-based + skills training) to determine whether the mindfulness components offer incremental benefits over an established, evidence-based intervention. Building on the REACH-VA framework, PAACC provides a direct comparison of a mindfulness-based approach versus a cognitive–behavioral approach for a high-burden veteran caregiving population.

1.6 | Study aims and hypotheses

While the broader goal of this RCT was to compare the effectiveness of PAACC and REACH-VA in reducing caregiver burden, depressive symptoms, stress, and rumination and improve compassion, mindfulness, and quality of life of PLWDs, this paper focuses on the study design and baseline characteristics of participating caregivers. Specifically, we aim to:

1. Describe participant demographics and clinical profiles at baseline.
2. Outline the study procedures used to implement PAACC and REACH-VA for caregivers of veterans living with dementia.
3. Detail the theoretical and structural differences between PAACC (mindfulness-based) and REACH-VA (cognitive-behavioral), highlighting the rationale for comparing these two approaches.

We do not present intervention outcomes here. Instead, we offer a detailed overview of the study's design, implementation, and baseline data, laying the groundwork for future publications that will examine the comparative effectiveness of PAACC versus REACH-VA.

2 | METHODS

2.1 | Study design

PAACC is a mindfulness-enhanced, skill-building intervention designed to reduce caregiver burden. This RCT was designed to evaluate the effectiveness of PAACC in comparison to an established caregiver intervention, REACH-VA. The trial is registered under ClinicalTrials.gov Identifier NCT03447860. The RCT includes two treatment arms: PAACC (treatment) and REACH-VA (control). Both participants and the researcher collecting the outcome data were blinded to the participant assignment. Participants were randomly allocated in a 1:1 ratio between the two arms, using block sizes varying from 2 to 4.

2.2 | Screening and intervention assignment

Caregivers who expressed interest in participating were scheduled for a face-to-face screening visit with study personnel. Informed consent was obtained during a private, face-to-face meeting, with the consent document including all elements outlined in the Veterans Health Administration Handbook 1200.05, as required by the Common Rule, and approved by the VA Central Institutional Review Board. After consent was obtained, participants completed a screening questionnaire, which included the Zarit Burden Interview (ZBI, $\alpha = 0.86$), an assessment of PLWD activities of daily living (ADLs) and

instrumental activities of daily living (IADLs), and the Montreal Cognitive Assessment (MoCA) to confirm eligibility. Eligible caregivers were then scheduled for a baseline visit, during which they were randomly assigned to either the PAACC group or the REACH-VA control group.

2.3 | Inclusion and exclusion criteria

This study recruited family caregivers of PLWDs who had been diagnosed with AD or TBI-related AD. Caregivers were eligible if they (1) resided with the PLWD or traveled daily to provide more than 5 h of care for 7 days per week; (2) experienced moderate to severe caregiver burden as measured by the Zarit Burden Scale; (3) assisted PLWDs with at least one ADLs or at least two IADLs; and (4) scored 23 or higher on the MoCA indicating sufficient cognitive functioning to benefit from the intervention.

Exclusion criteria included (1) a current diagnosis of Bipolar I disorder and/or psychosis, (2) acute psychiatric hospitalization within the previous 3 months, (3) significant changes in psychotropic medication use within the past month, (4) ongoing psychotherapy for a mood disorder, (5) imminent risk to self or others, (6) inability to provide informed consent, (7) active substance use disorder within the previous year, or (8) placement of PLWD in a nursing home or assisted living facility.

After prospective participants received detailed information about the study, a geriatric psychiatrist or geropsychologist administered the University of California, San Diego Brief Assessment of Capacity to Consent to determine whether they demonstrated adequate understanding, rational reasoning, appreciation of their situation, and their ability to communicate a decision. A score of 14 or higher was required for participation; caregivers scoring below this threshold were not recruited.

2.4 | Procedures

Participants were recruited from the memory clinic at the Center for Aging and Neurocognitive Services and primary care clinics within the Salem VA Health Care System. Recruitment was primarily facilitated through flyers and direct communication with VA clinicians. Of the 142 caregivers screened, 133 were randomly assigned to an intervention group (Figure 1). Caregivers received $50 for the screening visit, $50 for each of the four intervention sessions, and $100 for both the baseline and post-intervention assessments. Payments were made at the end of each study visit via check or debit card through a 501(c)(3) non-profit corporation supporting research activities at the Salem VAHCS.

2.5 | Study visits and session flow

Table 1 presents the content of each session for both PAACC and REACH-VA, including any homework assignments and focus areas (e.g., problem solving, mindfulness, cognitive restructuring). The screening

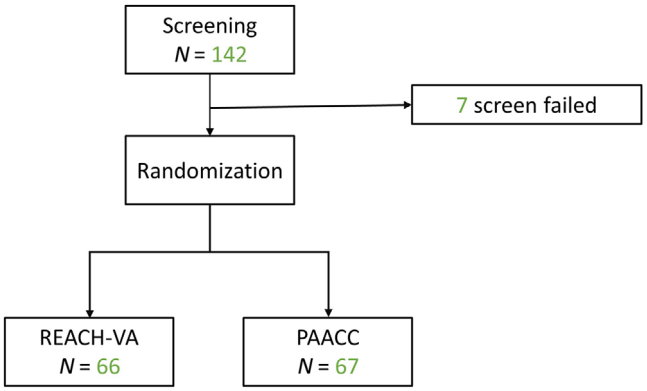

FIGURE 1 Screening and recruitment flow diagram.

visit (approximately 40 min) is used to assess prospective participants' eligibility according to the study's inclusion and exclusion criteria. Eligible caregivers then complete a comprehensive baseline assessment (approximately 60 min) during Visit 1, which includes measures such as caregiver burden measures, dementia-related behavioral checklists, and safety screening.

If they remain eligible, they proceed to Session 1 of their assigned intervention (PAACC or REACH-VA). Subsequent sessions last approximately 60 min each and occur every 2 weeks, giving caregivers an opportunity to practice newly introduced skills and exercises. At the post-intervention visit outcome measures are re-administered and caregivers receive guidance on sustaining or adapting the strategies they learned for the future – for instance, through referrals to local mindfulness programs or additional VA resources.

2.6 | Structure of interventions

PAACC consists of four core sessions plus the baseline and post-intervention visits. Each session targets two components: (1) managing dementia-related behaviors and (2) practicing both formal and informal mindfulness techniques. These core elements are further supported by education, problem solving, and role play to help caregivers adapt strategies to their own caregiving context.

Beginning in Session 2, the caregiver selects a problematic dementia-related behavior to address. This behavior is typically the most stressful or burdensome for the caregiver but also amenable to intervention (e.g., wandering, agitation). The interventionist works with the caregiver to help define the behavior in specific, objective terms, develop reasonable goals, and create a practical plan to address the behavior. Throughout subsequent sessions, this plan is regularly reviewed and modified as needed in subsequent sessions, with all outcomes and adjustments documented on a structured worksheet.

Every PAACC session also includes at least one formal mindfulness exercise (e.g., RAIN, STOP, mindful eating) and ongoing informal mindfulness practice (e.g., mindful walking, mindful communication). Between sessions, caregivers' complete homework assignments adapted from established Mindfulness-Based Stress

TABLE 1 PAACC and REACH-VA intervention structure.

Study visit	Main activities	
Screening visit (40 min)	Assess eligibility.	
Baseline assessment (60 min)	Complete caregiver (CG) and care recipient (CR) assessments	
	PAACC	REACH-VA
Session 1 (60 min)	1. Review PAACC notebook 2. Gather CG's story 3. Discuss multifaceted impact of stress 4. Introduce tenets of mindfulness 5. Introduce and assign mindful eating exercise for homework	1. Review CG notebook 2. Gather CG's story 3. Discuss multifaceted impact of stress 4. Introduce + practice signal breath 5. Assign signal breath homework
Session 2 (60 min)	1. Review mindfulness homework 2. Offer dementia education and information regarding healthy living 3. Identify dementia target behavior 4. Develop behavior plan (problem solve/role play) 5. Introduce mindful breathing 6. Assign mindful breathing homework	1. Review signal breath homework 2. Offer dementia education and information regarding healthy living 3. Identify dementia target behavior 4. Develop behavior plan (problem solve/role play) 5. Continue practicing signal breath
Session 3 (60 min)	1. Review mindfulness homework 2. Discuss progress on behavior plan 3. Modify behavior plan 4. Introduce mindful self-inquiry practice to help develop better in-the-moment awareness 5. Introduce and assign RAIN[a] and STOP[b] exercises for homework to help defuse intense emotions experienced in the moment	1. Review prior homework 2. Discuss progress on behavior plan and modify if needed 3. Introduce how our thoughts influence mood and behavior 4. Introduce cognitive restructuring and thought log 5. Assign cognitive restructuring homework and use of thought log
Session 4 (60 min)	1. Review mindfulness homework 2. Discuss progress on behavior plan and modify if needed 3. Introduce mindful compassion via loving kindness meditation to promote compassion and acceptance of unchangeable events related to dementia process 4. Review intervention and obtain closure	1. Review cognitive restructuring homework 2. Discuss progress on behavior plan and modify if needed 3. Continue cognitive restructuring and help identify pleasant activities for self-care 4. Review intervention and obtain closure
Post-intervention visit	1. Complete post-intervention outcome assessments 2. Develop plan for ongoing mindfulness practice. 3. Provide referrals/resources if needed	1. Complete post-intervention outcome assessments 2. Provide referrals/resources if needed

Abbreviations: PAACC, Practice of Acceptance, Awareness, and Compassion in Caregiving; REACH, Resources for Enhancing Alzheimer's Caregivers Health; VA, U.S. Department of Veterans Affairs.

[a]RAIN = **R**ecognize an emotion or experience, **A**llow it without suppression, **I**nvestigate it with curiosity and kindness, and embrace its **N**atural awareness by not identifying with fleeting sensations, emotions, or thoughts.

[b]STOP = **S**top, **T**ake a breath, **O**bserve thoughts/feelings/sensations, and **P**roceed mindfully with intention.

Reduction (MBSR) principles. Detailed session scripts are provided in the study protocol to ensure consistent delivery across different interventionists.

Like PAACC, REACH-VA also includes four core sessions plus baseline and post-intervention visits, but it is grounded in CBT. While it similarly uses education, problem solving, and role play, REACH-VA emphasizes cognitive restructuring (e.g., thought logs) and healthy behavior plans (e.g., identifying pleasant activities) to address caregivers' most pressing dementia-related challenges. In each session, the caregiver refines the behavior plan using structured problem-solving approaches and practices "signal breath" relaxation as a stress-reduction tool. Session 3 introduces cognitive restructuring, teaching caregivers to recognize and reframe the negative thought patterns, while Session 4 reviews cognitive restructuring homework and fine-tunes the plan to ensure lasting behavioral changes. As with PAACC, a final post-intervention visit is used to collect outcome assessments, discuss ongoing caregiver needs, and provide referrals to additional resources.

2.7 | Intervention fidelity and adherence

Both PAACC and REACH-VA are delivered by trained interventionists who follow a detailed manual to maintain protocol fidelity. Interventionists record session notes and complete standardized checklists to confirm each topic is covered. Ongoing supervision sessions help ensure consistency across multiple interventionists.

TABLE 2 Baseline and post-assessment questionnaires.

Questionnaire	Acronym	Description	Cronbach's alpha
Zarit Burden Interview[25]	ZBI	Measures caregiver burden	0.92
Patient-Health Questionnaire-9[26]	PHQ-9	Measure severity of depressive symptoms	0.84
Perceived Stress Scale[27]	PSS	Measures perceptions and appraisal of recent life events as stressful	0.78
Generalized Anxiety Disorder Screener[28]	GAD-7	Measures anxiety symptoms	0.89
Mindful Attention Awareness Scale[29]	MAAS	Measures mindfulness readiness	0.89
Compassion for Care Recipient[30]	-	Measures caregiver's feeling of toward care recipient (PLWDs)	
Rumination Reflection Questionnaire[31]	RRQ	Measures one's tendency to dwell on, rehash, and, revaluate events or experiences	0.94
Revised Memory and Behavior Checklist[32]	-	Measures memory and behavioral problems in PLWDs reported by the caregiver	0.81

Abbreviation: PLWD, person living with dementia.

2.8 | Study evaluations

Baseline evaluations assessed caregiver health, burden, stress, depression, self-care, and social support, along with problem behaviors of PLWDs. These assessments were conducted using widely accepted measures from caregiving literature[25–32] and were collected at baseline and after the intervention. Table 2 presents a description of the assessment tool along with its Cronbach's alpha. Demographic information, including age, race and socioeconomic status, living arrangement, and others were collected to help control for potential confounding factors. Additionally, data on session attendance were gathered.

3 | RESULTS

3.1 | Sample description

The overall sample consisted of 133 caregivers, with a mean age of 67.2 years (SD = 9.8). Most caregivers identified as female (85%) and White (81.7%). Regarding education, 20.8% had completed high school, and 76.9% had pursued education beyond high school. Nearly 70% were spouses and 23% were adult children of the PLWDs, with 90% co-residing with the PLWDs. Additionally, 62% were retired, while 16.3% reported working full-time.

3.2 | Group comparisons

Participants randomized to the REACH-VA intervention included 66 caregivers with a mean age of 68.3 years (SD = 9.8). Most were female (84.8%), White (81.8%), and had more than a high school education (79.7%). Spouses accounted for 71% of the REACH-VA group, while 20% were adult child caregivers, with 92% of the caregivers co-residing with the PLWDs. In terms of employment, 66.2% of REACH-VA caregivers were retired, and 15% were employed full-time.

Among the 67 caregivers randomized to the PAACC intervention, 85% were female, 82% were White, and 74% had education beyond high school. The mean age of PAACC participants was 66 years (SD = 9.8). Most of the caregivers in the PAACC sample were spouses (69%), while nearly a quarter were adult children (25%), with about 88% of caregivers co-residing. Additionally, a little over half of the caregivers (58%) were retired, and 17% were employed full-time. There were no statistically significant differences in demographic characteristics between the two groups at baseline, ensuring comparability (Table 3).

3.3 | Baseline comparisons of study outcomes

Table 4 presents the baseline comparisons of study outcomes. A statistically significant difference was found in mindfulness readiness scores (Mindfulness Awareness Attention Scale [MAAS]; $t = 2.21$, $p < 0.05$), with REACH-VA participants having a higher average score ($M = 61.92$; SD = 12.34) than PAACC participants ($M = 56.86$; SD = 13.88). REACH-VA participants also had significantly lower scores on the Patient Health Questionnaire (PHQ-9), which measures the severity of depressive symptoms, with a mean score of 8.56 (SD = 5.14) compared to 10.73 (SD = 6.6) for PAACC participants ($t = -2.11$, $p < 0.05$). Additionally, REACH-VA participants had lower scores on the Generalized Anxiety Disorder Screener (GAD-7), with a mean of 7.42 (SD = 5.12), compared to 9.54 (SD = 5.58) for PAACC participants ($t = -2.27$, $p < 0.05$). No other statistically significant differences were found between the groups for the remaining study variables.

4 | DISCUSSION

This study presents the design and baseline findings of a RCT examining a mindfulness-based caregiver intervention (PAACC), implemented in comparison to an established best practice intervention, REACH-VA. The focus of this study is on family caregivers of veterans living with AD and other dementias, a population that is particularly vulnerable

TABLE 3 Demographics and clinical characteristics of enrolled participants for the two intervention groups.

	REACH-VA ($N = 66$)		PAACC ($N = 67$)		Comparison
Variables	***M* (SD)**	***n* (%)**	***M* (SD)**	***n* (%)**	***t*-statistic/χ^2**
Age	68.32 (9.8)		66.03 (9.8)		1.34 (0.18)
Sex					
Male		10 (15.2%)		10 (14.9%)	0.001 (0.97)
Female		56 (84.8%)		57 (85.1%)	
Race					
African American		12 (18.2%)		11 (16.9%)	1.05 (0.59)
White/Caucasian		54 (81.8%)		53 (81.5%)	
Hispanic		0		1 (1.5%)	
Education					
Less than high school		1 (1.6%)		2 (3%)	0.68 (0.71)
High school		12 (18.8%)		15 (22.7%)	
More than high school		51 (79.7%)		49 (74.2%)	
Relationship with CR					
Spouse		46 (70.8%)		46 (68.7%)	7.08 (0.13)
Partner (not married to CR)		0		1 (1.5%)	
Child		13 (20%)		17 (25.4%)	
Sibling		0		2 (3%)	
Other		6 (9.2)		1 (1.5%)	
Living situation					
Live in same house		61 (92.4%)		58 (87.9%)	2.01 (0.37)
Lives in own home (<20 min from CR)		3 (4.5%)		7 (10.6%)	
Lives in own home (>20 min from CR)		2 (3%)		1 (1.5%)	
Years living with CR	33.01 (21.4)		32.07 (19.4)		0.25 (0.80)
Current occupation					
Always been a homemaker		3 (4.6%)		4 (6.2%)	5.13 (0.53)
Retired		43 (66.2%)		37 (57.8%)	
Employed (full-time)		10 (15.4%)		11 (17.2%)	
Employed (part-time)		5 (7.7%)		3 (4.7%)	
Unemployed but looking for a job		1 (1.5%)		0	
Disability		2 (3.1%)		6 (9.4%)	
Other		1 (1.5%)		3 (4.7%)	

Abbreviations: CR, care recipient; PAACC, Practice of Acceptance, Awareness, and Compassion in Caregiving; REACH, Resources for Enhancing Alzheimer's Caregivers Health; SD, standard deviation; VA, U.S. Department of Veterans Affairs.

due to higher incidences of PTSD and TBI given the complexities of military experiences.[33] This paper provides an overview of the study design and in-depth description of the baseline characteristics of caregivers, offering critical insights into the challenges faced by caregivers of veterans.

The PAACC intervention was designed to incorporate an individualized approach to dementia caregiving that not only supported caregivers with dementia education but also the skills to assist with behavioral management, all while focusing on present-focused awareness and mindfulness-based practices. This holistic approach aims to support caregivers in managing stress and emotional reactivity while improving their caregiving skills, thereby addressing emotional and practical challenges caregivers face in their daily lives. PAACC intervention also emphasizes accepting the disease process and one's caregiving role, fostering awareness of thoughts, emotions, and bodily sensations, and exercising compassion toward oneself and others. These elements collectively aim to increase self-compassion and improve the quality of life for both the caregiver and PLWD.

Baseline analyses confirmed the comparability between the groups on most demographic characteristics, though differences were observed in mindfulness readiness, depression, and anxiety scores. These differences highlight the importance of considering caregivers'

TABLE 4 Baseline comparison of study outcomes.

Outcome measures	Acronym	REACH-VA ($n = 66$) M (SD)	PAACC ($n = 67$) M (SD)	Comparison *t*-statistic
Zarit Burden Interview	ZBI	72.44 (11.7)	75.42 (11.39)	−1.49
Patient-Health Questionnaire-9	PHQ-9	8.56 (5.14)	10.73 (6.6)	**−2.11***
Perceived Stress Scale	PSS	20.11 (6.75)	21.76 (7.11)	−1.37
Generalized Anxiety Disorder Screener	GAD-7	7.42 (5.12)	9.54 (5.58)	**−2.27***
Mindful Attention Awareness Scale	MAAS	61.92 (12.34)	56.86 (13.88)	**2.21***
Compassion for Care Recipient	-	123.55 (13.59)	121.54 (15.27)	0.80
Rumination Reflection Questionnaire	RRQ	36.73 (9.95)	37.69 (11.71)	−0.50
Revised Memory and Behavior Checklist	-	31.25 (11.33)	31.17 (13.28)	0.04

Abbreviations: PAACC, Practice of Acceptance, Awareness, and Compassion in Caregiving; REACH, Resources for Enhancing Alzheimer's Caregivers Health; SD, standard deviation; VA, U.S. Department of Veterans Affairs.
Boldface and an asterisk (*) indicate statistically significant findings at $p < 0.05$.

mental health and psychological readiness when implementing interventions, as the success of any intervention depends on the caregivers' willingness and ability to engage with and apply the skills being taught. Although the primary focus of this paper is to describe the study's design and participant characteristics, these baseline findings provide an essential foundation for future analyses. Accounting for differences in depression, anxiety, and mindfulness awareness will be important when evaluating the PAACC intervention's impact on caregiver burden and well-being.

This study is the first to test a mindfulness-based intervention on caregivers of veterans with dementia, a group facing distinct challenges due to higher rates of PTSD, TBI, and other service-related conditions in their relatives. By providing a detailed overview of the study design, methods, and baseline participant characteristics, this paper lays the groundwork for future research into the effectiveness of mindfulness-based interventions and caregiver skill-building programs tailored to this population. The baseline findings highlight the need for interventions that address both the mental health and emotional well-being of caregivers, particularly those caring for veterans with complex neurocognitive conditions. Future analyses will evaluate the full impact of the PAACC intervention, with the potential to reduce caregiver stress and improve quality of life for both caregivers and PLWDs.

AUTHOR CONTRIBUTIONS

Mamta Sapra: Writing—review and editing; project administration; investigation; conceptualization. **Lauren Hagemann**: Writing—review & editing; project administration; investigation; conceptualization. **Katherine Luci**: Writing—original draft preparation; project administration; investigation; conceptualization. **Jyoti Savla**: Writing—review and editing; project administration; investigation; conceptualization; methodology; data curation; formal analysis.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest. Author disclosures are available in the supporting information.

DISCLOSURE STATEMENT

Authors have nothing to disclose.

CONSENT STATEMENT

Written informed consent was obtained from all participants before enrollment in the study.

CLINICAL TRIAL REGISTRATION

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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