

Caregiver Connect: A Mobile Application for Stress Tracking and Support Delivery Among Paid Dementia Caregivers

Yagna Manasa Boyapati (PhD Candidate) • Maggie Beach (M.S. Student) • Dr. Arshia Khan (Professor) — Dept. of Computer Science, University of Minnesota Duluth, USA

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Introduction

Dementia caregivers, whether paid staff or unpaid family members, face a high degree of challenge to their mental, emotional, and physical well-being, often leading to chronic stress, burnout, and social isolation. Existing support systems rarely offer individualized, accessible resources to meet these needs. Caregiver Connect is a mobile app that responds with tailored resources, emotional support, and communication tools designed to enhance caregivers’ well-being and the quality of dementia care they provide.

Background

Prior work reports that nearly one quarter (24%) of caregivers experience a high perceived burden, with anxiety in 20% and symptoms of depression in another 20% (Cotelo et al., 2015). As dementia cases rise, traditional support systems remain insufficient. A tailored application can provide emotional support, stress-management tools, and communication with healthcare professionals — gaps that digital tools and peer support have been shown to meaningfully narrow by reducing isolation, building resilience, and promoting continuity of care.

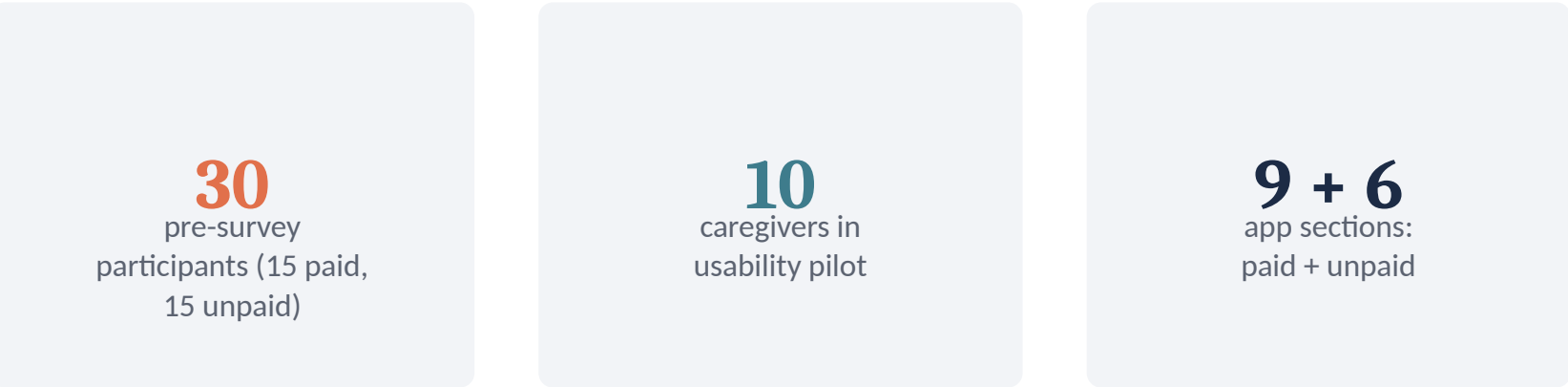
Problem & Research Question

Problem: there is a pressing need for an integrated, accessible digital intervention that addresses the emotional, functional, and informational needs of paid and unpaid dementia caregivers, to reduce stress and isolation and improve care quality.

Research Question: in what ways can a mobile application like Caregiver Connect be designed to most effectively support dementia caregivers in reducing stress and isolation and enhancing care quality?

Methods

Caregiver Connect was built with Flutter and Dart for cross-platform iOS/Android compatibility, with Firebase as the backend for secure data storage, real-time synchronization, and user authentication. Development followed three iterative phases: (1) initial design and wireframing, (2) incorporation of user feedback, and (3) full implementation. A pre-survey of dementia caregivers identified feature priorities; a follow-up usability pilot then tested the refined prototype for navigation and feature relevance.



What the Pre-Survey Found

- 80% reported loneliness:** felt lonely often due to caregiving demands
- 70% cited stress management:** ranked it as a top caregiving challenge
- 60% wanted more communication:** with peers or family members

Study Status

The app is fully developed and reflects this design prototype, with all functionality operational and Firebase integration for secure data handling. Formal effectiveness testing has not yet occurred: a nursing-home pilot with dementia caregivers is planned pending Institutional Review Board (IRB) approval, to evaluate usability and outcomes under real-world conditions.

App Prototype

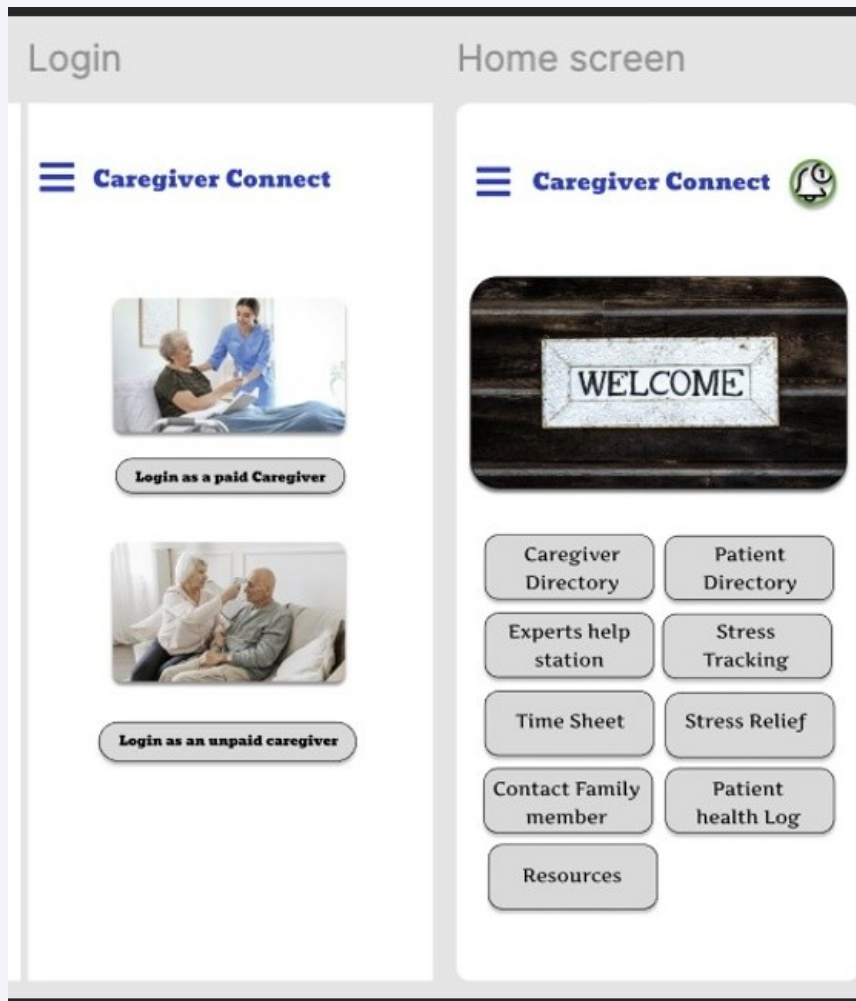


Fig. — Login and home screen for paid caregivers: nine sections including Caregiver Directory, Stress Tracking, Timesheet, and Stress Relief.

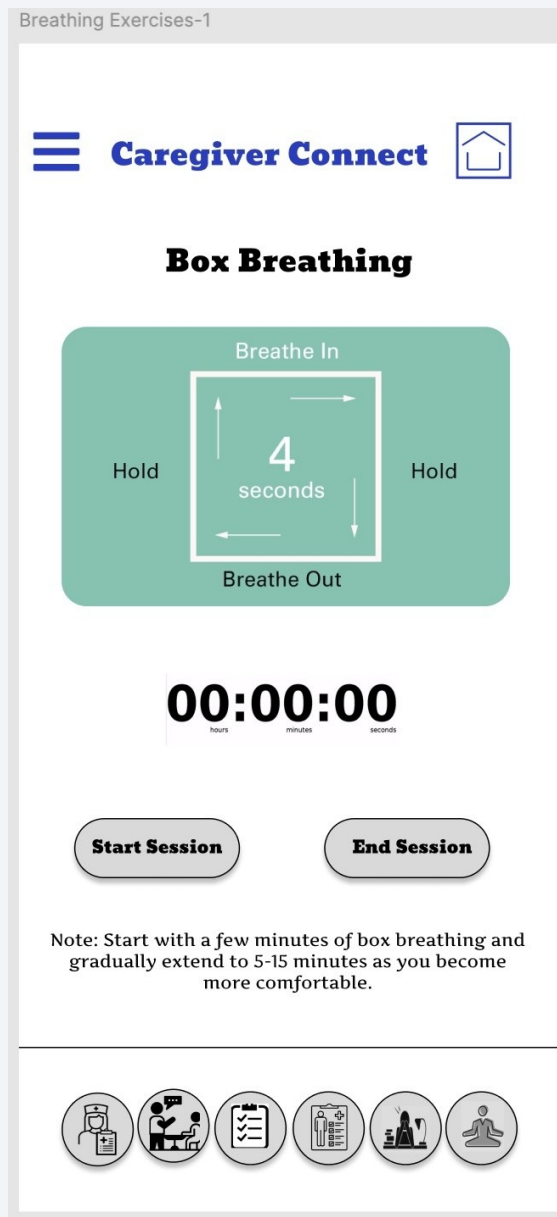


Fig. — Box Breathing, one of two in-app guided breathing exercises (with 4-7-8 Breathing) in the Stress Relief module.

Stress Relief Toolkit

Breathing exercises, hydration reminders, mood-based nutrition tips, therapeutic games, cognitive exercises, music playlists by mood, and peer support groups — seven tools in one module.

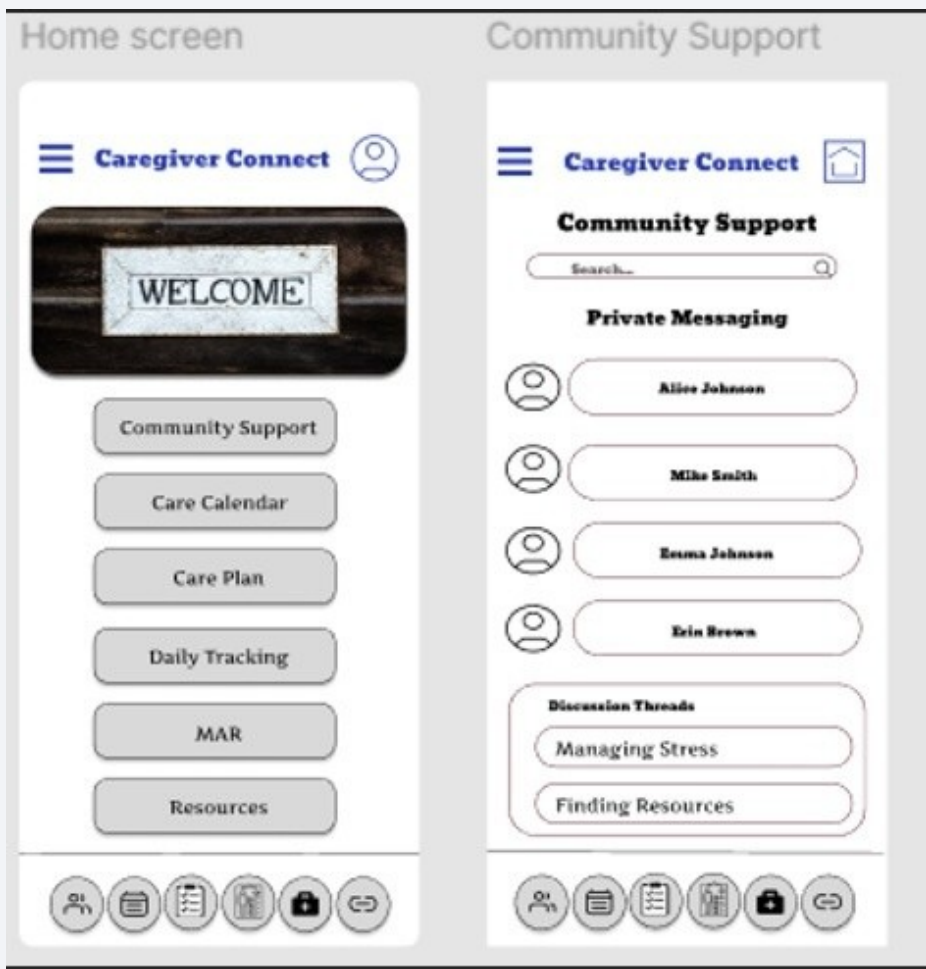


Fig. — Home screen and Community Support for unpaid (family) caregivers — a parallel six-section interface: Community Support, Care Calendar, Care Plan, Daily Tracking, MAR, and Resources.

Results: Design Coverage

- Stress management (70%) → Stress Tracking + 7-tool Stress Relief module
- Communication needs (60%) → Family Messaging + Caregiver Directory
- Loneliness / isolation (80%) → Support Groups + peer-to-peer directory
- A parallel 6-section interface serves unpaid family caregivers

Discussion

These design choices align with prior caregiver research: emotional support and functional resources as burnout-prevention (Brodaty & Donkin, 2009; Farina et al., 2017), communication and care-coordination tools reducing family conflict (Afram et al., 2015), and expert access addressing role confusion and isolation (Quinn et al., 2009).

Future Work

- IRB-approved nursing-home pilot measuring caregiver burden, standardized stress scales, and app-usage frequency
- Wearable-device integration for automated stress tracking
- AI-personalized recommendations and expanded teleconsultation network

References

Brodaty & Donkin. Family caregivers of people with dementia. Dialogues Clin. Neurosci. 11(2), 2009.
Quinn, Clare & Woods. Impact of relationship quality on caregiver wellbeing. Aging Ment. Health 13(2), 2009.
Afram et al. Needs of informal caregivers during transition to institutional care. Int. Psychogeriatr. 27(6), 2015.
Farina et al. Factors associated with quality of life of family carers. Alzheimer's Dement. 13(5), 2017.
Cotelo et al. Burden in family caregivers of Alzheimer's patients in Spain. Pharm. Pract. 13(2), 2015.



Take-Home Message

Caregiver Connect translates a 30-caregiver needs survey directly into a fully built, dual-interface app — pairing stress tracking with peer support and coping tools. Formal effectiveness testing in a nursing-home setting is the planned next step, pending IRB approval.