Cognitive Stimulation Therapy for Residents With Dementia in Long-Term Facilities: A Quasi-Experimental Study

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Dementia is a widespread disease among aging individuals, with reports addressing that approximately 5.8 million adults, ages 65 and older, in the United States have some form of the condition (Zubatsky et al., 2023). The Centers for Disease Control and Prevention (CDC) projects that by 2060, rates of this disease will rise to 14 million people (Centers for Disease Control and Prevention, 2019). Dementia is a prevalent developmental and progressive brain disease, involving the decline of memory, language, learning, judgment, problem-solving, visual‑spatial skills, and attention (Kearney & Trull, 2018). The term 'dementia' encompasses various forms, with Alzheimer's disease being the most prevalent, accounting for 60%–78% of cases, and vascular dementia following at 15% (Kearney & Trull, 2018). As dementia progresses, it is typically classified into mild, moderate, or severe stages. The stages are indicative of the impairment of cognition; thus, mild dementia means mild cognitive decline and may indicate a decrease in independence (Dementia Care Central, 2023). For people with dementia (PwD), various symptoms can hinder the successful and safe completion of activities of daily living (ADLs). Management of dementia may include pharmaceuticals, Cognitive Behavioral Therapy, psychotherapy, and psycho-educational interventions, Behavioral Management Therapy, environmental approaches/modification, dementia support groups, memory training, alternative therapies, and cognitive stimulating environments (Alzheimer's Association, n.d.; Berg‑Weger & Stewart, 2017).

Cognitive Stimulation Therapy

Among non-pharmacological interventions, Cognitive Stimulation Therapy (CST) has emerged as a promising approach to support cognitive functioning and promote occupational

engagement in individuals with mild to moderate dementia. CST is a type of holistic evidence-based individual or group intervention program designed to stimulate learning, functionality, cognition, and quality of life (QoL) in mild-to-moderate dementia (Berg‐Weger & Stewart, 2017; Bertrand et al., 2023; Orrell & Zarit, 2018). Research addresses that applying CST to the aging population can delay cognitive decline and can reduce the risk of dementia (Apóstolo et al., 2014; Berg‐Weger & Stewart, 2017; Bertrand et al., 2023; Bhowmik et al., 2023; Yuill & Hollis, 2011). CST consists of structured group activities such as word games, hand movements, or making photo frames performed twice weekly for 7-weeks (Elmiyanti & Salamung, 2022). The general structure of each session includes an introduction, theme song, current affairs activity, the main activity, suggested activities for home, and closure (Berg‐Weger & Stewart, 2017; Orrell & Zarit, 2018). CST is intended to stimulate thinking, concentration, and memory skills in PwD (Kelly et al., 2017; Woods et al., 2012, as cited in Saragih et al., 2022). Activities are implemented based on the interests and abilities within the group, and trained CST facilitators are skilled to adjust the activities in real time based on participation and engagement levels (Collins et al., 2023).

Occupational Therapy and CST

Occupational therapy helps people of all ages participate in meaningful daily activities—such as self-care, work, school, and community life—by using everyday tasks (occupations) to promote health, well-being, and independence (AOTA, 2025). Occupational therapy's scope of practice includes interventions for cognition, caregiver training, functional tasks, and group treatments (AOTA, 2020). Because CST incorporates interventions that resemble occupational therapy such as ADLs, instrumental activities of daily living (IADLs), leisure, health management, and social participation, it falls within occupational therapy's scope

of practice (AOTA, 2020). Occupational therapists possess specialized training that equips them for supporting PwD and facilitating the implementation of CST. With their therapeutic expertise, holistic approach, and client-centered focus, occupational therapists are equipped to deliver CST, especially in group settings, where they can manage group dynamics, address group and individual needs, prioritize client-centered care, and provide encouragement (Spector et al., 2008, as cited in Collins et al., 2023).

Expanding CST: The Need for Occupational Therapy Involvement

Research addresses the benefit of using CST with PwD in various settings such as outpatient, residential communities, inpatient, and virtual, but majority of these studies do not include occupational therapists administering CST (Aguirre et al., 2013; Apóstolo et al., 2014; Bertrand et al., 2023; Bhowmik et al., 2023; Cove et al., 2014; Gibbor et al., 2021; Gil et al., 2022; Lok et al., 2020; Orfanos et al., 2021; Zubatsky et al., 2023). International studies support the combination of occupational therapy and CST for the treatment of mild-to-moderate dementia (Collins et al., 2023; Yuill & Hollis, 2011). However, there is limited research on the efficacy of CST in the United States. According to University College London (2023), there are two U.S. contacts registered with the International CST Center who have administered CST in research studies. Currently, the St. Louis University and Perry County Memorial Hospital within St. Louis, Missouri are administering CST and hosting CST training sessions for professionals in the United States. Even though Perry County Memorial Hospital does provide CST as an occupational therapy service, research has not been implemented beyond Missouri nor includes outcome measurements in the long-term care setting.

Research in memory care aims to enhance care, cognition, independence, and QoL for PwD. The efficacy of CST in enhancing cognition in people with mild-to-moderate dementia has

been established (Woods et al., 2012, as cited in Orrell & Zarit, 2018). The cognitive and social stimulation provided during CST promotes occupational engagement and improvement in ADLs (Ryan & Brady, 2023). As dementia progresses, PwD often experience functional decline which can impact their ability to perform their ADLs (Chen, 2022). CST is an intervention that can help improve an individual's ability to perform and engage in their meaningful occupations. As healthcare and knowledge of dementia evolves, it is important to assess the effectiveness of CST and evaluate the qualifications needed to administer it within settings.

Study Summary and Objectives

This research examined the effectiveness of CST while aiming to support and validate the role of occupational therapy and promote its integration into long-term care settings across the United States. Currently, there is limited research on occupational therapists implementing CST with older adults living with dementia in long-term care facilities. The purpose and aims of this research study were to: 1) investigate the preliminary effect of CST on cognition and engagement in individuals with mild-to-moderate dementia, and 2) assess the feasibility of implementing CST in LTC facilities in the Cincinnati metropolitan area. The objective of this research was to answer the following question: Does CST improve cognitive functioning and increase engagement levels in individuals with mild-to-moderate dementia residing in long-term care facilities? We hypothesized that individuals with mild-to-moderate dementia who participated in a 7-week CST program in a long-term care facility would exhibit significantly higher levels of engagement and cognitive functioning compared to baseline.

Methods

A quasi-experimental, single-group pretest-posttest design was used to evaluate the effects of engagement and cognitive functioning in a group CST program. The study was

conducted as a student-led research project by occupational therapy doctoral students from Northern Kentucky University (NKU) who had completed their didactic coursework, including a group intervention course, and their first Level II fieldwork prior to engaging in on-site activities.

Although a randomized controlled trial (RCT) was initially planned, recruitment challenges, time constraints, and logistical limitations led to a modification of the study design. The modification addressed an ethical concern regarding the control group not receiving the intervention, as a delayed intervention was not logistically feasible for the researchers. Due to the nature of the study design, no blinding of participants or researchers occurred. The study was approved by NKU's Institutional Review Board for human subjects research (IRB # 2562) and revisions to the study protocol were approved prior to the start of the intervention. The study was registered at ClinicalTrials.gov (NCT06978972) and made public in June 2025. The study was conducted from May to August 2025 at a long-term care facility in southeast Indiana that provides memory care, assisted living (ALF), and skilled nursing (SNF) care. Data was collected between June and August 2025.

Participants

Recruitment, data collection, consenting, and CST-related activities took place at Ridgewood Health Campus, including–Legacy Lane (memory care), the assisted living facility, and the health campus building, all located on the same site in Lawrenceburg, Indiana– using a convenience sampling approach. This is a facility owned and operated by Trilogy Health Services, LLC in Lawrenceburg, Indiana. Ridgewood Health Campus has facilities dedicated to memory care, skilled nursing, and assisted living. All facilities provide residents with apartments, 24/7 on-site healthcare staff, dining halls, transportation services, salons, indoor and outdoor common areas, and community gardens. Cognitive stimulation activities were held in the

memory care building (Legacy Lane) on the Ridgewood Health Campus. The memory care building includes open and accessible common areas that provide adequate space for conducting CST sessions without interfering with other facility operations. On-site nursing and medical staff were available as needed to support participant care. Researchers collaborated closely with facility staff to address any concerns related to the intervention, environment, or individual participants, ensuring the safety and well-being of everyone involved. In the event of an adverse incident during the study or treatment, researchers planned to follow HIPAA regulations and the facility's established protocols. Incidents were planned to be promptly reported to the Principal Investigator (PI) and the facility staff.

An occupational therapy student researcher collaborated with staff on-site during the spring of 2025 to review the study information to prepare the staff to identify individuals who meet the inclusion criteria. The student performed recruitment, which involved convenience sampling within the SNF, ALF, and memory care units, contacting the participant and, when applicable, their power of attorney (POA) using approved recruitment scripts, information handouts, and consent forms, in person or by phone. The informed consent forms and participant handout were developed at an 8th-grade reading level to ensure accessibility and understanding for individuals with cognitive impairments or limited health literacy. The POA is an individual who is legally responsible for an individual and was able to provide consent for the study alongside their family member with dementia. Two consent processes were used: a dual consent form for individuals with a POA, requiring signatures from both parties in recognition of the cognitive considerations associated with dementia, and a standard form for those without a POA. Consent was obtained either electronically or in person with physical signatures. All participants and their POAs (if applicable) provided written or verbal reconsent prior to the intervention due

to the study design change. The student repeated this process with multiple participants and POAs until the sample size was achieved. Before recruitment, researchers established a target sample size based on the *CST Making a Difference 1* Manual, which recommends 5 to 8 participants per group. To account for potential variability in attendance due to scheduling conflicts, mood fluctuations, or health-related absences, a sample size of 10 participants ($N = 10$) was set to help maintain a consistent group size of 5 to 8 participants per session.

Characteristics of individuals enrolled in the intervention group included individuals who were: 18 years or older with diagnosed mild-to-moderate dementia according to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), confirmed by medical records, or a score in the mid-range (18–55) on the Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Cog), live in a long-term care facility, and were engaging in at least 45 minutes a week of recreational or social activities. Additional characteristics included proficiency in English, adequate vision, hearing, and speech to participate in groups. All participants and their POAs (if applicable) who provided consent were included.

Characteristics of individuals that were to be excluded from the study were: 17 years of age or younger; were not receiving maintenance or recreational services; have communication barriers such as aphasia; do not speak English as a first or second language; have a severe case of dementia; receiving hospice care; score in the high range (56–70) or no impairment range (0–17) on the ADAS-Cog; prior CST treatment; history of traumatic brain injury or learning disability; and participation in a concurrent clinical trial that could influence outcomes that are being assessed.

Study Procedures

Before the start of the study, participants underwent a screening measure where they

performed the ADAS-Cog–a neuropsychological test designed to assess the severity of cognitive impairment–to assess for cognitive impairment (Schafer et al., 2013). Another occupational therapy student researcher from the NKU Occupational Therapy program demonstrated competency in administering the ADAS-Cog under the supervision of a licensed occupational therapist prior to conducting the screenings. Participants who scored within the mild-to-moderate range (18–55) on the screening were eligible for admission into the study and proceeded to pretesting. Pre-testing and post-testing were conducted by a different NKU occupational therapy doctoral student, also supervised by a licensed occupational therapist, who had demonstrated competency in administering the Montreal Cognitive Assessment (MoCA) and The Observational Measurement of Engagement-Modified (OME-Modified) to minimize bias. The MoCA and OME-Modified were administered to participants as primary outcome measures to evaluate levels of cognitive impairment and engagement. The MoCA is a standardized tool that assesses cognitive domains: attention, executive functions, short-term and working memory, language, visuospatial, and orientation (Nasreddine, 2017). Scores range from 0 to 30, with scores of 18 to 25 indicating mild impairment, 10 to 17 indicating moderate, and 0 to 9 indicating severe (Nasreddine, 2017). The MoCA was selected due to its sensitivity to changes in cognition (Julayanont et al., 2013).

The OME-Modified assessed engagement through the assessment of a participant's response to a stimulus during an activity, taking note of their attention and attitude using standardized rating scales. The OME-Modified was selected due to its focus on the core outcomes, ease of use in an applied setting, high intra-class correlation value (.78), and high inter-rater reliability (0.84 – 0.92) (Cohen-Mansfield et al., 2010). Participants performed each assessment on alternate days to limit cognitive fatigue.

After screening and pre-testing were completed, the participants received CST in a group setting twice weekly, on Monday and Wednesday mornings, for 45 to 60 minutes each for 7 weeks. Sessions were co-facilitated by two doctoral occupational therapy students under the supervision of a licensed occupational therapist in the state of Indiana to ensure proper implementation of the intervention and adherence to professional and ethical standards. Additionally, the co-facilitators were trained in CST by the North American CST Training Institute through the Saint Louis University School of Medicine prior to the start of the intervention. The general structure of each session followed the *Making a Difference 1* CST manual for consistency and accurate delivery of the intervention. Each session was based on a theme and included an introduction, theme song, current affairs activity, the main activity, and closure.

Based on previous research involving CST, there is no documentation of any harmful side effects following participation. Therefore, this indicates minimal risk of harm for participants who receive CST. However, there are potential risks of psychological and emotional effects during group participation, which could lead to feelings of anxiety, stress, and altered behavior. However, previous research has indicated that CST can improve psychological well-being in this population instead of causing harm/distress. There is also a risk that participants' identifiable information could be accidentally disclosed in a group setting.

Monitoring and Participation Forms from the *CST Making a Difference 1* manual were used to document attendance and session-level ratings of participant enjoyment, mood, interest, and communication (Spector et al., 2021). The forms were completed after each session by two occupational therapy doctoral students who co-facilitated the sessions. Participant ratings for enjoyment, communication, and interest were recorded on a 4-point scale of 1 (none) to 4 (lots)

(Spector et al., 2021). Mood was rated using a separate 4-point scale: 1 (anxious/depressed) to 4 (happy/relaxed) (Spector et al., 2021). The forms were not distributed to participants but were discussed at the end of each session. The feedback surveys involved participants raising their hands to indicate if they liked the session "a lot," "a little," or "not at all," followed by two open-ended questions: what they enjoyed and what could be improved (Spector et al., 2021). The CST Monitoring Forms data will be explored in a future retrospective study.

At the end of the 7-week period, participants performed the OME-Modified and MoCA for the posttest outcome measures again. During post-test administration of the OME-Modified, participants who demonstrated limited interest in the initial stimulus were retested using an alternative stimulus. This adjustment was made because the high stimulation of CST sessions may have reduced the appeal of the pre-test stimulus, potentially affecting the accuracy of results.

Ethical Considerations

During the study, participants were free to change their minds and withdraw from the study at any time without penalty. Participants were allowed to refuse treatment on any given day for any reason. During sessions, participants also had the right to leave the study or decline to participate in specific group activities (e.g., warm-up song) without any negative consequences. During evaluation and assessment, participants could skip any questions they did not wish to answer. Whatever the participant decided would not result in any loss of benefits or services to which they were otherwise entitled.

Data Collection and Management

Data were collected between June and August 2025 using participant ID codes. Names were excluded from data collection sheets, which included only ID codes and initials to prevent

confusion. Physical documents were stored in a password-protected file folder, and digital data sheets are on two encrypted flash drives. Informed consent forms and medical records are secured in the faculty advisor's office in the locked file folder due to identifiable information being present; no identifiable data are stored on flash drives. Access is limited to the research team and faculty advisor. Data will be retained for six years and then paper documents will be shredded and digital storage devices securely wiped.

Statistical Analysis Plan

Data were analyzed using IBM SPSS Statistics (Version 29). Demographic characteristics were analyzed using descriptive statistics. Normality of the data was assessed using the Shapiro-Wilk test, which indicated that the majority violated assumptions of parametric testing (Gil et al., 2022). A one-tailed Wilcoxon signed-rank test was conducted to assess pre- and post-intervention outcomes (Gil et al., 2022; Lok et al., 2020). To reduce a Type I error from multiple comparisons, a Bonferroni correction was applied to adjust the significance level to $p \leq .0045$ for the OME-Modified and $p \leq .05$ for the MoCA. Effect sizes (r) were calculated using $Z/\sqrt{N}$ (0.1 = small effect, 0.3 = medium, 0.5 = large). Confidence intervals for r could not be computed due to sample size and software limitations. Due to the statistical probability of change in subtests, descriptive statistics were used to determine whether the performance in MoCA and OME-Modified subtests increased, decreased, or maintained.

Data inclusion was predetermined at 50% attendance, equivalent to attending at least two-thirds of each session and 7/14 sessions. Participants outside this criterion were classified as dropouts and excluded, with their data removed. This approach ensured that the analysis reflected outcomes from participants who meaningfully engaged in the intervention.

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