Narrative Review Article

Comparing the Effects of Different Intergenerational Programs on Cognitive Function in Older Adults

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ABSTRACT

This review paper examines the impact of intergenerational activities between older adults and younger individuals across community, institutional, home-based, and remote settings on the cognitive health of older adults. It synthesizes findings from randomized controlled trials and observational studies that have explored various types of intergenerational programs, including mentoring, volunteering, companionship, and educational activities. Across studies, outcomes commonly include mood, social connection, self-esteem, and cognitive performance in older adult participants. While several studies report positive effects on cognitive and psychosocial outcomes, the evidence suggests variation by program type and intensity. High-engagement models such as mentoring are associated with improvements in executive function and related cognitive domains, whereas lower-intensity support-based programs primarily affect psychosocial well-being with more limited cognitive change. This review also highlights key characteristics of effective programs, including sustained engagement, structured interaction, and cognitive challenge, as well as the importance of program design in shaping outcomes. Despite promising findings, the literature is limited by small sample sizes, short intervention durations, and inconsistent methodologies. Overall, the findings indicate a need for more rigorous, long-term studies to clarify which types of intergenerational activities most effectively support cognitive health in older adults.

Keywords: Intergenerational Interaction; Intergenerational Programs; Cognition; Cognitive Decline; Mild Cognitive Impairment

INTRODUCTION

Loneliness and social isolation among older adults are increasingly recognized as major public health concerns (1). In 2023, the U.S. Surgeon General identified loneliness as a national epidemic (2). Specifically, older populations have been affected due to reduced social networks, geographic separation, and changing family structures (3, 4). These risks were further intensified during the COVID-19 pandemic, when lockdowns significantly reduced social contact for older adults worldwide (5). Social isolation has been strongly associated with increased risks of mortality, cardiovascular disease, mental health disorders, and dementia (6-10), highlighting its broad impact on both physical and cognitive health. Together, these findings have intensified interest in interventions that can promote both social engagement and cognitive well-being in aging populations.

One proposed strategy to address social isolation in older adults is intergenerational programming, which

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involves structured interactions between older and younger individuals for mutual benefit (11). To evaluate these diverse programs, this review utilizes a conceptual framework that groups interventions into four primary models: mentoring, support, companionship, and one-on-one interaction (Figure 1). As illustrated in Figure 1, this classification system distinguishes between high-intensity, structured interactions and lower-intensity models focused on emotional support (11, 12). These varying forms of intergenerational engagement may also influence cognitive aging by stimulating verbal communication, memory retrieval, attention, and executive functioning through repeated social interaction.

Despite growing interest in intergenerational programs, the evidence base for their cognitive effects remains limited and methodologically inconsistent. Existing studies are often small, short-term, and highly variable in design and outcome measures, making direct comparison difficult (12). As a result, it remains unclear which types of intergenerational interaction are most effective for supporting cognitive health in older adults.

Cognitive health refers to the ability to think clearly, learn new information, remember, and make decisions, which are skills that are essential for maintaining independence and quality of life in older adulthood (13, 14). Normal aging may involve mild declines in memory, attention, or processing speed, but severe deficits are not typical (13, 15, 16). Dementia involves progressive loss of cognitive abilities, including memory, language, and problem-solving, that significantly impair independent living (17). Mild cognitive impairment (MCI), in contrast, is an intermediate stage between normal cognition and dementia, characterized by measurable cognitive deficits that do not yet substantially interfere with daily functioning (18). Consistent social engagement has been linked to greater cognitive reserve, suggesting that structured intergenerational programs may help preserve cognitive function and delay cognitive decline (19-21).

In this review, cognitive health is conceptualized in terms of specific domains, including memory, attention, executive function (decision-making, goal-setting, etc.), and verbal fluency (15). These functions are explored in relation to how different types of intergenerational programs may affect cognitively healthy older adults as well as those with early-stage impairment. This review evaluates how different intergenerational program structures influence cognitive outcomes in older adults and identifies which characteristics of engagement most effectively support cognitive aging.

MENTORING

Mentoring programs are intergenerational programs that pair older adults with younger individuals in structured roles such as tutoring, academic assistance, or

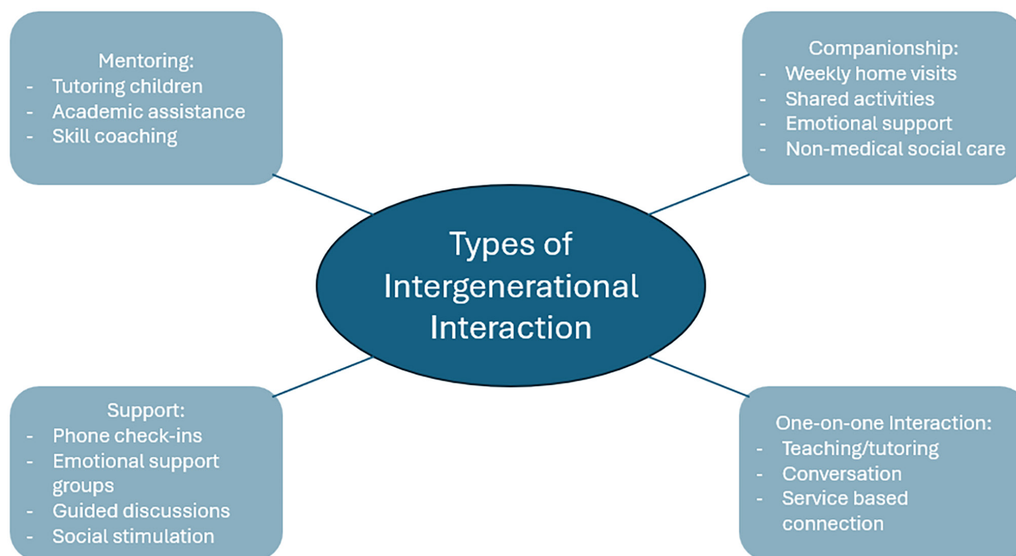

Figure 1. *Types of intergenerational interaction models discussed in this review. Four common forms of intergenerational programs, mentoring, support programs, companionship/home visits, and one-on-one interaction, are organized by their level of structure, engagement and potential cognitive stimulation for older adults.*

life coaching. They are typically conducted in schools, after-school settings, or community centers, and are designed to foster mutual benefit and engagement through sustained interaction (22, 23). (see Table 1 for overview of all discussed studies). Mentoring roles require regular engagement in verbal fluency, memory retrieval, and planning tasks, all of which are associated with maintaining or improving cognitive function in older adults (24).

Cognitive Effects in Older Adults

For cognitively healthy older adults, mentoring has been linked to improvements in areas such as verbal fluency, memory, and executive function. One prominent example is the American Association of Retired Persons's program (AARP), Experience Corps. Experience Corps is a U.S. based intergenerational program in which older adults (60+ years old) volunteer in elementary schools to tutor and mentor children in reading and academic support. In a Baltimore pilot study, participants who engaged in the program for six months demonstrated increased activation in the prefrontal cortex (25). A larger randomized controlled trial involving 149 older adult volunteers showed significant improvements in executive function, with participants in the Experience Corps group improving by 13.5% more than controls on behavioral tasks (24, 26). These cognitive gains were associated with a

Table 1. *Summary of discussed studies and corresponding reference numbers. PFC= Prefrontal Cortex; fMRI = Functional Magnetic Resonance Imaging; EC = Experience Corps; RCT = Randomized Controlled Trial; MoCA = Montreal Cognitive Assessment; MCI = Mild Cognitive Impairment; HCI = Home-Visiting Cognitive Intervention; ADAS-Cog = Alzheimer's Disease Assessment Scale-Cognitive Subscale.*

Reference	Category	Outcome Measures	Method	Central Numerical Findings
Carlson *et al*. (24, 25)	Mentoring / One-on-one	Executive Function; Prefrontal Activation	Prospective controlled trial; fMRI + EC program (6 months)	Moderate effect: Cohen's *d EC* approx. 0.20-0.35; significant increase in left PFC activation during inhibitory tasks.
Fried *et al*. (26)	Mentoring / One-on-one	Executive Function (Stroop); Memory	RCT (149 adults)	Participants improved 13.5% more than controls on executive function tasks over 6 months.
George & Singer (27)	Mentoring / Volunteering	Stress (Cortisol); Quality of Life (QoL)	RCT (5 month)	Statistically significant decrease in stress levels; large effect size (Cohen's d = 1.21); notable increase in "generativity" scores (sense of leaving a legacy).
Dodge *et al*. (34)	Support (Remote)	Global Cognition (MoCA); Memory	RCT (Video calls 4x/week)	Healthy: +1.75 MoCA gain. MCI: +2.19 gain in immediate encoding memory; significantly slowed decline vs. control.
Pitkälä *et al*. (33)	Support (Group)	Global Cognition (ADAS-Cog); Well-being	RCT (12 months)	Small effect: -2.6 point improvement on ADAS-Cog (lower is better) vs. -1.6 in control.
Lee *et al*. (35)	Companionship (Home)	Global Cognition (MMSE-DS)	8-week quasi-experimental	Moderate effect: MCI group showed +2.4 point improvement in MMSE scores; no change in physical ADLs.
Chua *et al*. (30)	Companionship (Home)	Loneliness; Depression; Social Bond	Meta-analysis (14 RCTs)	Large effect: Significant reduction in loneliness scores; cognitive benefits were secondary/qualitative.
Cattan *et al*. (31)	Companionship (Home)	Mental Engagement; Social Isolation	Qualitative Review	High efficacy in alleviating loneliness; found that group-based social activity was more effective than 1:1 visits.

moderate effect size (Cohen's *d*) ranging from 0.20 to 0.35 for inhibitory control (24).

Evidence for older adults with mild cognitive impairment (MCI) is more limited, but promising. In a 5-month randomized intervention study, older adults with mild-to-moderate dementia (a more advanced neurodegenerative condition) volunteered as mentors in a school, engaging in reading and art activities with children. Results showed a decrease in stress levels for the volunteering group compared to the control, suggesting that even with cognitive decline associated with dementia, complex social roles like mentoring are feasible and beneficial for quality of life (27).

Available evidence suggests that mentoring and other high-engagement intergenerational programs may produce the strongest cognitive benefits, particularly in executive function, memory, and verbal fluency, due to their emphasis on sustained, goal-directed interaction (22, 24, 26, 28). In contrast, lower-intensity companionship models tend to produce more modest or domain-specific cognitive effects, while also contributing to psychosocial well-being (29-31).

Implications and Future Directions

Overall, mentoring programs offer clear cognitive benefits for healthy older adults, particularly in executive function, memory, and verbal fluency (22, 23, 25). For those with mild cognitive impairment, evidence is limited but encouraging, indicating that with appropriate adaptations such as simplified tasks and supportive structures, mentoring programs remain accessible and meaningful (32). The promising results from intergenerational volunteer programs highlight the need for further research to design scalable, inclusive intergenerational mentoring programs that can benefit a wider range of cognitive abilities (32). Such efforts help maximize the potential of intergenerational engagement as a tool to promote cognitive health and social well-being across the aging spectrum.

SUPPORT PROGRAMS

Support programs for older adults include phone check-ins, peer-led groups, community helplines, and structured emotional or informational support, offered in-person or remotely. These low-intensity services aim to reduce loneliness and promote emotional and social engagement among individuals who are socially isolated or homebound (29).

Cognitive Effects in Older Adults

Among cognitively healthy older adults, structured social support has demonstrated improvements in both mental health and cognitive function. In a Finnish randomized controlled trial, socially stimulating group sessions involving art, physical activity, and guided discussions led to significantly greater cognitive improvement, measured using the Alzheimer's Disease Assessment Scale–Cognitive Subscale (ADAS-Cog), compared to a control group over three months. The intervention group achieved a -2.6-point improvement on the ADAS-Cog scale (where a lower score indicates better function), significantly outperforming the control group's -1.6-point change (33). At the 12-month follow-up, participants also reported improved mental well-being, including improvements in mood, reduced loneliness, and enhanced life satisfaction. Another large randomized clinical trial, the I-CONECT study, delivered frequent structured conversational engagement to adults aged 75 and older via video calls. This conversational intervention significantly improved cognition, with participants achieving a 1.75-gain on the Montreal Cognitive Assessment (MoCA), along with improvements in language-based aspects of executive function (34). These findings suggest that regular, meaningful social stimulation may support cognitive resilience.

The I-CONECT trial also included individuals with MCI; after six months of structured conversational interaction, MCI participants showed significant gains in immediate encoding memory compared to controls. Specifically, the MCI group demonstrated a 2.19-point increase in immediate memory recall scores (based on the Craft Story recall task), a gain that slowed the expected trajectory of cognitive decline (34). These results suggest that support-based conversational engagement programs may improve cognitive performance in individuals with MCI, in addition to enhancing mood and emotional well-being.

Challenges and Future Directions

Despite promising results, support programs may face barriers for consistent delivery, reliance on trained facilitators, and limited applicability for individuals with more advanced cognitive decline. Future approaches should explore hybrid delivery models that integrate both remote and in-person outreach and tailor content to match participants' cognitive capacities. By contrast, group-based or support-style programs may be easier to scale but less personalized, which may limit their cognitive impact even if they enhance social well-being.

HOME VISIT AND COMPANIONSHIP PROGRAMS

Home-visit and companionship programs involve volunteers, caregivers, or trained peers visiting older adults in their homes to provide social interaction, emotional support, or basic assistance. These programs are designed to reduce loneliness, increase daily cognitive and social stimulation, and improve well-being in individuals who may have limited mobility or access to community resources. In contrast to clinical home care, companionship programs typically do not involve medical tasks but instead focus on relationship-building, often through conversation, shared activities, or simple companionship (31).

Cognitive Effects in Older Adults

For cognitively healthy older adults, structured companionship programs have been associated with improvements in mental health and cognitive function. A 2023 systematic review of 14 randomized controlled trials found that home-based social interventions significantly increased social connectedness and reduced loneliness and depressive symptoms (30). Most trials reported positive outcomes, though some shorter or less frequent programs showed weaker effects. Qualitative findings from a 2024 systematic review indicated that older adults receiving home-based programs reported improved self-worth, a stronger sense of purpose, and greater mental engagement (30).

A Korean quasi-experimental study tested an 8-week Home-Visiting Cognitive Intervention (HCI) in which community volunteers visited older adults living alone once a week to conduct structured sessions on memory, attention, problem-solving, and language skills. Participants included both cognitively healthy adults and those with mild cognitive impairment, referred to as the "mild cognitive impairment" (MCI) group. Cognitive performance was evaluated using the Mini-Mental State Examination–Dementia Screening (MMSE-DS), a version of MMSE tailored for dementia screening in Korean older adults. Both groups showed statistically significant improvements in overall MMSE scores after the 8-week intervention, but the MCI group displayed a notable 2.4-point gain in overall cognitive functioning. Functional independence was assessed via the Instrumental Activities of Daily Living (IADL) scale, and no significant changes were observed in either group (35). These results suggest that in-home cognitive training may yield measurable benefits in mental function, particularly for individuals already experiencing cognitive decline.

Limitations and Future Directions

While the Korean HCI study showed positive short-term outcomes, its lack of a randomized control group limits the ability to attribute observed cognitive improvements to the intervention. Without a comparison group, it is not possible to determine whether the changes were due to the program itself or to other factors, such as social interaction or placebo effects. Additionally, the study did not track long-term outcomes, leaving it unclear whether the gains were sustained over time. Future research should evaluate the cognitive effects of low-cost companionship interventions, compare activity-based versus unstructured formats, and assess outcomes in larger, controlled trials to determine the most effective models for different cognitive profiles (35).

ONE-ON-ONE INTERACTION

One-on-one intergenerational programs pair older adults with younger individuals in highly individualized interactions structured to promote cognitive engagement, emotional connection, and social stimulation. Unlike structured mentoring programs, which center on defined roles such as tutoring or academic instruction, one-on-one models emphasize flexible, relationship-based engagement that adapts to the cognitive and emotional needs of each participant. Programs such as Memory Bridge pair students with older adults living with dementia for conversation, storytelling, and shared reflection, prioritizing presence and communication over task completion (36). These interactions are often unstructured or semi-structured, allowing cognitive stimulation to arise through dialogue, memory recall, and interpersonal connection. This adaptability allows one-on-one programs to be accessible to individuals across a wide range of cognitive abilities, including those with mild cognitive impairment (MCI) and dementia.

Cognitive Effects in Older Adults

For cognitively healthy older adults, one-on-one intergenerational interaction provides opportunities for personalized cognitive stimulation through conversation, problem-solving, and adaptive communication. Unlike group-based or role-driven programs, these interactions require sustained attention, verbal processing, and flexible thinking within a dynamic social exchange. Cognitive demand

arises less from formal tasks and more from real-time engagement, memory retrieval during conversation, and interpretation of younger partners' perspectives. This individualized format may support executive function and verbal fluency, potentially by adjusting cognitive load to the participant's abilities, which may reinforce mental flexibility and engagement (25, 26). In addition to cognitive benefits, participants often report an increased sense of purpose, emotional fulfillment, and reduced feelings of isolation, suggesting that psychological and cognitive outcomes may be closely intertwined in this model (26).

Evidence for one-on-one intergenerational programs in older adults with mild cognitive impairment is more limited but promising. Although not strictly a one-on-one interaction model, the Experience Corps pilot trial demonstrated that older adults with lower baseline cognitive performance, meaning lower initial scores in areas such as working memory, processing speed, or recall, were able to engage in structured tutoring roles. Participants volunteered in elementary schools, helping children with reading and classroom activities for about 15 hours per week, which required planning, attention, and verbal communication. Cognitive outcomes were assessed through tests like the Stroop Color–Word and Trail Making (executive function), Rey Auditory Verbal Learning (memory), verbal fluency, and Digit Symbol Substitution (processing speed), alongside fMRI scans (26). These findings suggest that structured, individualized interaction may provide sufficient cognitive stimulation to maintain or stabilize cognitive function in at-risk individuals, even when baseline performance is lower (26, 28). The relative consistency in effect sizes across cognitive groups (Cohen's $d \approx 0.20–0.28$) reinforces that structured, individualized interaction, rather than baseline cognitive status, may be an important factor underlying these benefits (25, 26). The structured, individualized format may support both cognitive challenge and accessibility, suggesting that consistent, purposeful engagement may help slow decline and preserve executive function (26).

Limitations and Future Directions

Despite promising findings, research on one-on-one volunteering programs for older adults, particularly those with cognitive decline, is still limited in scope and scale. Many existing studies have small sample sizes or lack control groups, making it difficult to isolate the effects of the intervention. Programs incorporating individualized engagement, such as Experience Corps have shown cognitive benefits in some participants (26), but results may not generalize to older adults with more advanced dementia or different cultural contexts. Moreover, logistical challenges—such as sustaining long-term volunteer commitment and ensuring appropriate training for volunteers working with cognitively impaired adults—remain underexplored. Future research should prioritize large-scale, randomized controlled studies that compare structured versus informal models, investigate long-term cognitive and emotional outcomes, and assess how to tailor programs to specific types and stages of cognitive decline

IN PERSON VS. REMOTE PROGRAMS

Programs for older adults are increasingly delivered in both in-person and remote formats, particularly following the COVID-19 pandemic. In-person models enable physical presence, nonverbal communication, and hands-on activities, which may be especially beneficial for individuals with moderate to severe cognitive decline or dementia (37). In contrast, remote delivery via phone or video calls may offer greater accessibility, especially for those with mobility or transportation limitations (38). The I-CONECT trial, a randomized controlled study conducted in the U.S., evaluated remote conversational engagement in socially isolated older adults (including those with Mild Cognitive Impairment) through video calls four times a week (34). Cognitive outcomes were assessed at baseline and after six months using standardized tests such as the Montreal Cognitive Assessment (MoCA), verbal memory recall, and verbal fluency tasks. Participants in the intervention group showed significantly less cognitive decline, and in some cases modest improvement, compared to controls, suggesting that remote social interaction may help slow cognitive decline (34). These findings suggest that both in-person and remote approaches may be effective, but their suitability may depend on the level of cognitive decline, access to technology, and personal preference.

LIMITATIONS AND FUTURE DIRECTIONS

Research on intergenerational programs and cognitive aging is limited by several methodological and structural challenges. Studies vary substantially in design, duration, and outcome measures, making direct comparisons difficult (12, 22, 25). Many investigations rely on small, localized samples, often with limited

socioeconomic, racial, and cultural diversity, which reduces generalizability. Short-term programs, ranging from 6 to 12 weeks, also make it difficult to assess the sustainability of cognitive benefits over time (27, 34, 35). Another limitation is the lack of standardized cognitive outcome measures. While some studies use validated neuropsychological assessments, like the Stroop Test or Montreal Cognitive Assessment (MoCA), others rely on self-report or non-comparable assessment tools, creating inconsistencies in the evidence base (26). Additionally, few studies include true control groups or long-term follow-up, which limits the ability to draw causal conclusions about observed improvements.

Current evidence suggests that the most effective intergenerational interventions emphasize structured, sustained engagement that integrates both cognitive challenge and social connection. Programs combining purposeful activity (such as tutoring, collaborative art, or storytelling) with emotional exchange appear to optimize both cognitive stimulation and participant motivation. Training for volunteers, adaptable program structures, and inclusion of participants across different levels of cognitive functioning may further improve accessibility and program effectiveness.

Future program development may extend these benefits through new or hybrid intervention models. Digital intergenerational programs, such as virtual tutoring, online storytelling, or technology-based skill exchanges, could expand access for homebound or rural older adults while maintaining social and cognitive engagement. The integration of remote and in-person approaches, as demonstrated in the I-CONECT trial, may also create more flexible and inclusive opportunities for intergenerational engagement (34).

Future research should prioritize larger, longitudinal, multi-site studies using standardized cognitive and psychosocial outcome measures to clarify which program characteristics are most effective. Research efforts should also emphasize inclusivity by ensuring participation from older adults across varying levels of cognitive functioning, racial and cultural backgrounds, and levels of technological or social access. Hybrid models that combine in-person and digital approaches may enhance scalability and accessibility while still allowing individualized engagement (34). Researchers should also examine the mechanisms underlying cognitive benefits, such as changes in neural activation, emotional well-being, and social motivation, to better understand how intergenerational contact protects against cognitive decline. Finally, cross-disciplinary collaborations among gerontology, neuroscience, and technology-related disciplines may generate innovative program designs that extend the reach and impact of intergenerational engagement on cognitive aging. Innovative formats could include collaborative creative projects or multigenerational learning environments designed to promote reciprocal learning and cognitive engagement.

CONCLUSION

This review examined how intergenerational programs influence cognitive health in older adults by synthesizing evidence across mentoring, support, companionship, and individualized interaction models. Overall, these interventions consistently demonstrate the potential to enhance cognitive and emotional well-being. However, structured and sustained programs such as mentoring and individualized interaction appear to produce the strongest effects on executive function and cognitive engagement, with moderate effect sizes ($d \approx 0.35$) reported in several studies (24, 26). While support and companionship programs offer important emotional benefits and some improvements in global cognitive measures, their effects are often more limited in scope compared to the broader cognitive benefits associated with highly engaging mentoring-based interventions (28, 31, 34).

Across the program types, the common factor driving success appears to be meaningful reciprocal engagement that combines social connection with cognitive challenge. When older adults participate in purposeful, cognitively stimulating interactions, they may maintain stronger cognitive performance and improved psychological well-being. The growing body of evidence suggests that intergenerational connection may serve not only a social function but also a meaningful public health strategy for promoting healthy cognitive aging. As the aging population continues to expand, programs that foster intergenerational engagement may play an important role in addressing social isolation and age-related cognitive decline. In this way, intergenerational practice may evolve from a developing intervention model into a more widely integrated strategy for supporting cognitive health in aging populations.

CONFLICT OF INTEREST

The author declares that there are no conflicts of interest related to this work.

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