

# A review of animal-assisted therapy for older adults in Korea: effects on depression and cognitive function and implications for practice

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## Abstract

This review aimed to identify effective animal-assisted therapy (AAT) programs for older adults and to evaluate their practical and policy applications by analyzing assessment tools for depression and cognitive function. Korea became a super-aged society in 2025, with individuals aged 65 years and older accounting for more than 20% of the population. Mental health problems, including cognitive decline, depression, and dementia, have emerged as major social challenges. In response, AAT is increasingly used as a preventive and therapeutic intervention. Canine-assisted AAT reduced depression by promoting emotional bonding, social interaction, and physical activity. It also enhanced emotional stability by increasing oxytocin levels. In addition, AAT improved cognitive functions such as attention, memory, and language ability, even in older adults with mild cognitive impairment and dementia. Assessment tools including the mini-mental state examination, montreal cognitive assessment, Addenbrooke's cognitive examination III, and geriatric depression scale-Korean version have been widely used to measure these changes. Overall, AAT is an effective non-pharmacological intervention that improves cognitive, emotional, and social functions in older adults. Therefore, these findings support its preventive and clinical applications.

**Keywords:** Animal-assisted therapy, Depression, Cognitive function, Older adults in Korea

## INTRODUCTION

As of 2025, Korea has entered a super-aged society, with adults aged 65 and over accounting for more than 20% of the population. As the older population increases, welfare, healthcare, and economic burdens have increased. Mental health problems among older adults, including cognitive decline, depression, and dementia, are not limited to individual and family issues and have become social and structural challenges [1]. Therefore, Preventive approaches such as intervention programs, mental health services, and social participation are required. Multidimensional interventions addressing decreased quality of life and increased suicide rates are also needed.

In response, the human-animal bond (HAB) and animal-assisted therapy (AAT) are used as

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 Data curation: Kim M.  
 Formal analysis: Kil T.  
 Methodology: Kim M.  
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 Writing - original draft: Kil T.  
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preventive and therapeutic approaches. For older adults, HAB is not limited to simple affection for animals. It supports psychological and emotional stability and contributes to mental health. HAB is an important research area linking health, welfare, society, and the environment [2–6].

AAT is defined as a structured and goal-directed intervention that uses animals to achieve therapeutic objectives in healthcare, social welfare, education, and rehabilitation. Recent studies have shown that AAT is an effective method for applying HAB in practice. AAT explains the human–animal relationship and shows its effects on health and welfare. It is widely used in therapeutic, educational, and rehabilitative settings [3,7,8].

Previous studies applying canine-assisted AAT to older adults have reported beneficial effects. These include clinical treatment for patients with dementia and psychiatric disorders [9–11], improved psychological and behavioral outcomes in long-term care facilities [12–14], and improved cognitive function and mental health in older adults living alone [14,15]. AAT is also used as a preventive and alternative intervention based on human–animal interaction. However, comprehensive trend analyses that integrate research trends, gaps, and future directions are still limited.

In this context, analyzing research trends on the effects of AAT on depression and cognitive function in older adults is important. Understanding research trends is important for academic and practical development. Research trend analysis in AAT is important for the following reasons. First, AAT is associated with various disciplines, including psychology, social welfare, education, and nursing. Therefore, its concepts and applications vary across fields. Trend analysis helps identify changes in concepts, mechanisms, and applications. Second, empirical studies have been conducted in both general and specific populations of older adults. Assessment tools vary depending on the type of animal used. Trend analysis helps identify consistent effects and areas requiring further research. Third, trend analysis helps identify research gaps, including understudied populations, cultural differences, and long-term effects. These findings support future research directions and practical applications. Fourth, applying AAT in welfare, rehabilitation, and mental health policy requires evidence of effectiveness, safety, and ethics. Therefore, this study provides a basis for future policy development.

**Animal-assisted therapy programs for older adults**

AAT is a psychotherapeutic technique that uses animals as a medium and applies structured programs to achieve outcomes aligned with the client's symptoms and intervention goals. For older adults, canine-assisted AAT has several features. First, it provides emotional stability through bonding with the animal and alleviates loneliness and depression. Second, interaction among older adults and communication with therapists occur through the animal. Third, activities with the animal, such as walking, petting, and feeding, promote physical movement and support functional maintenance and rehabilitation. Fourth, caring for the animal and remembering its name stimulate cognitive functions, including memory and attention. Fifth, bonding with the animal helps older adults find meaning and enjoyment in life. Sixth, AAT is tailored to the health status of older adults, allows a multidisciplinary approach involving various professionals, and includes both short- and long-term effects [11,16–19].

In Korea, several studies have conducted trend analyses of AAT programs. Paik and Choi [17] examined the types of animal-assisted activities and therapy, theoretical frameworks, developmental stages, units of intervention, problem types, intervention goals, types of therapy animals, hygiene and ethical considerations, researchers' backgrounds, and contextual factors. Bae et al. [8] analyzed authorship, publication year, research design, study participants (sample size, age, and characteristics), intervention characteristics (content, duration, and methods), types of therapy animals, measurement tools, and ethical considerations. Lee and Yun [20] analyzed publication

year and source, research methodology, target population, clinical characteristics, and dependent variables. Lee and Ko [21] examined publication year, intervention type, sample size, number of sessions, session duration, and dependent variables. However, only Lee and Kim [21] conducted a systematic literature review of AAT for older adults, and their analysis focused on comparisons between domestic and international studies. Further research is needed to integrate existing findings, strengthen academic and practical applications, and provide future research directions based on emerging topics and methodologies.

## THE PSYCHIATRIC AND PSYCHOSOCIAL-ENVIRONMENTAL FOUNDATIONS OF DEPRESSION

Depression is a mood disorder characterized by persistent symptoms including sadness, feelings of worthlessness, and loss of interest. Unlike temporary mood changes, depression causes significant impairment in daily functioning. From a psychiatric perspective, the DSM-5 defines major depressive disorder (MDD) as the primary diagnostic category, with core symptoms including depressed mood and a loss of interest or pleasure at least two weeks [22,23]. Recent neuroscientific studies indicate imbalances in neurotransmitters such as serotonin, norepinephrine, and dopamine. These studies also show functional abnormalities in the amygdala and prefrontal cortex based on fMRI findings [24,25].

From a psychological perspective, psychoanalytic theory suggests that internal conflict, experiences of loss, and repressed aggression contribute to depression [26]. Cognitive theory explains that negative cognitive schemas and distorted thinking patterns maintain depressive symptoms [27]. From social and environmental perspectives, stress-related events, lack of social support, and economic hardship are associated with the onset and progression of depression [28–30]. Recent studies suggest an integrative model in which genetic vulnerability, stressful life events, and social context interact to produce depressive symptoms. Recent studies include digital healthcare approaches, such as mobile app-based cognitive behavioral therapy (CBT) and online counseling, as well as biomarker identification and AI-assisted diagnostic tools [31–34].

### Depression assessment tools for older adults

To measure depression, psychiatry and psychology–social sciences widely use epidemiological depression scales, clinician-rated instruments, and brief self-report questionnaires (Table 1). Epidemiological and screening scales such as the center for epidemiologic studies depression scale (CES-D) and the patient health questionnaire-9 (PHQ-9) are widely used. These scales are particularly useful for screening depressive symptoms in epidemiological research and identifying depressive disorders [35,36]. Clinical diagnostic and severity assessment scales include the Beck depression inventory (BDI), the Hamilton depression rating scale (HAM-D), and the Montgomery–Åsberg depression rating scale (MADRS). These scales are widely utilized in psychiatric clinical settings and for evaluating treatment outcomes [37–39]. The Zung self-rating depression scale (SDS) is a brief self-report measure that assesses depressive symptoms in both general populations and clinical populations [40].

### Research and epidemiological investigations: CES-D, PHQ-9

CES-D is a brief self-report instrument developed by Radloff [41] to measure depressive symptoms in the general population. The items include depressive symptoms previously identified in longer instruments, including depressed mood, guilt and worthlessness, helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. The revised Korean version by Lee et

**Table 1. Depression measurement tools**

Measurement tools	Description
CES-D	Self-report scale for assessing depression in the general population
PHQ-9	Self-administered diagnostic tool for psychiatric patients
BDI	Self-report scale for evaluating depression severity in both general and clinical populations
HAM-D	Scale designed for patients diagnosed with depressive disorders
MADRS	Clinician-rated scale used in clinical research and psychiatric practice to assess depression severity and treatment outcome
SDS	One of the most widely used self-report scales for measuring depression
GDS-K	Standardized Korean version of the geriatric depression scale

CES-D, center for epidemiologic studies depression scale; PHQ-9, patient health questionnaire-9; BDI, Beck depression inventory; HAM-D, Hamilton depression rating scale; MADRS, Montgomery-Åsberg depression rating scale; SDS, self-rating depression scale; GDS-K, geriatric depression scale Korea version.

al. [42] is widely used for depression screening in both epidemiological research and clinical settings.

PHQ-9, developed by Kroenke et al. [35], is a self-administered version of the PRIME-MD diagnostic instrument. It is one of the most widely used tools for screening and assessing depression in both clinical practice and research. PHQ-9 consists of nine items based on the DSM-IV criteria and is used to identify major depressive disorder. It assesses the frequency of symptoms over the past two weeks, and supports clinical diagnosis and severity assessment. The Korean version revised by Park et al. [43] has demonstrated acceptable validity and reliability.

#### **Clinical diagnosis and severity assessment: BDI, HAM-D, MADRS**

BDI is a widely used 21-item self-report scale used to assess depression severity in both general and clinical populations [37]. It was developed by Beck et al. in 1961 based on cognitive theory of negative distortions as a central mechanism of depression, and later revised into the BDI-IA (1978) and BDI-II (1996). The scale is not limited to a specific theoretical model. A shortened version, BDI fast screen (BDI-FS) for Medical Patients, is used in primary care settings. It consists of seven self-report items assessing major depressive symptoms over the previous two weeks [44].

HAM-D is a clinician-administered scale used in patients with depressive disorders. It quantifies symptoms based on clinical interviews and observations. The accuracy of the assessment depends on the interviewer's ability to obtain relevant information. Clinicians may use all available information to derive a final rating. As such, HAM-D is widely used in depression treatment and research and is applied to evaluate treatment outcomes [38].

MADRS is a clinician-rated scale used to assess depression severity and treatment response in clinical and research settings. It was developed by Montgomery and Åsberg [39] and is designed to changes following antidepressant treatment, with emphasis on emotional and cognitive symptoms. The Korean version developed by Kim et al. [45], has shown reliability and validity across multiple studies and is used in psychiatric clinical practice and in research on antidepressant efficacy.

#### **Brief self-report assessments: SDS**

SDS is one of the oldest and most widely used self-report scales for assessing depression. It was developed by Zung [40]. The scale evaluates physical, psychological, and emotional symptoms and is completed by patients. It is used for both diagnosis and assessment of symptom severity.

#### **Geriatric depression scale Korea version**

Geriatric depression scale Korea version (GDS-K) is used to assess the level of depression in older

adults and can be administered in a short period of time. The original Geriatric Depression Scale by Yesavage et al. [46] was standardized into a Korean version by Gi and Lee [47] to measure depression in patients with dementia. GDS-K developed by Cho et al. [48] was designed to screen for major depressive disorder based on DSM-III-R criteria in clinical populations.

## THE EFFECTS OF ANIMAL-ASSISTED THERAPY ON DEPRESSION IN OLDER ADULTS

Several studies have shown that canine-assisted AAT reduces depression in older adults [12,15,25,49–52]. It provides emotional support, promotes social interaction, and increases physical activity. In particular, interaction with therapy dogs increases oxytocin levels and improves emotional stability and positive affect, which reduces depressive symptoms [53].

As shown in Table 2, AAT reduced depression among older adults. Among institutionalized older adults, depression scores in the experimental group decreased from 8.00 ( $\pm$  3.18) at baseline to 4.74 ( $\pm$  2.54) at one week and 4.05 ( $\pm$  2.32) at four weeks after the intervention. In contrast, the control group showed 7.85 ( $\pm$  3.13) at baseline to 7.85 ( $\pm$  3.01) at one week and 8.10 ( $\pm$  2.90) at four weeks after the intervention. The change in the experimental group was significant, whereas the

**Table 2.** Effects of animal-assisted therapy (AAT) on depression in older adults

Researchers (Reference)	Participants (n)	AAT intervention method	Measurement tools and key findings
Shin et al. [12]	• Older adults aged 65 or older residing in a nursing home in Daegu (n = 41)	• 12 sessions, once weekly for 2 hours, nursing home residents • Experimental group (n = 19), Control group (n = 22)	• Pretest–posttest–follow-up assessment using the SGDS-K scale • Key findings: Depression scores in the experimental group showed a statistically significant reduction, whereas no significant change was observed in the control group
Choi et al. [49]	• Older adults aged 65 or older suspected of mild cognitive impairment (n = 3)	• 15 sessions, once weekly for 30 minutes, older adults suspected of mild cognitive impairment • Single-case experimental design; Experimental group (n = 3)	• Depression assessed at each session using the Geriatric Depression Scale-K • Key findings: A sustained reduction in depressive symptoms was observed in all participants throughout the intervention period
Kim et al. [52]	• Older adults aged 65 or older with mild to moderate dementia residing in a nursing home (n = 6)	• 12 sessions, twice weekly for 1 hour, nursing home residents with mild to moderate dementia • Experimental group (n = 3), Comparison group (n = 3)	• Pretest–posttest assessment using the Zung Self-Rating Depression Scale • Key findings: All participants showed reductions in depressive symptoms following the AAT
Lee et al. [15]	• Older adults aged 70 or older with dementia hospitalized in a geriatric hospital K (n = 12)	• 11 sessions, twice weekly for 60 minutes, dementia patients in a geriatric hospital • Experimental group (n = 6), Control group (n = 6) • Ethical considerations addressed	• Pretest–posttest assessment using the SGDS-K scale • Key findings: A significant reduction in depressive symptoms was observed in the experimental group of older adults with dementia
Jang et al. [54]	• Two older adult couples with mild cognitive impairment attending a Dementia Relief Center (n = 4)	• 8 sessions, once weekly for 50 minutes, older adult couples with mild cognitive impairment at a Dementia Relief Center • Experimental group (n = 4) • Ethical considerations addressed	• Pretest–posttest assessment using the SGDS-K scale • Key findings: A positive effect on depressive symptoms was observed in older adult couples with mild cognitive impairment
Oh et al. [89]	• Older adults diagnosed with mild cognitive impairment at two senior day-care centers (n = 20)	• 12 sessions, twice weekly for 60 minutes, older adults attending two senior day-care centers • Experimental group (n = 10), Control group (n = 10) • Ethical considerations addressed	• Pretest–posttest measurement using the Geriatric Depression Scale Short Form–Korean Version • Key findings: A significant difference was observed between pretest and posttest depression scores in the experimental group
Shin et al. [51]	• Older adults residing in a nursing home (n = 14)	• 12 sessions, older adults residing in a nursing home • Experimental group (n = 7), Comparison group (n = 7) • Ethical considerations addressed	• Pretest–posttest comparison using the Center for Epidemiologic Studies Depression Scale • Key findings: Depression scores in the experimental group began to decrease from the sixth session and showed a more pronounced reduction after the twelfth session

control group showed no significant difference. It suggests that AAT can positively influence the psychological and emotional states of institutionalized older adults [12]. Also, in older adults with suspected mild cognitive impairment, all session scores remained below the threshold, indicating reduced depressive symptoms [49].

In older adults with mild to moderate dementia in long-term care facilities, depression scores were 10 points lower in the experimental group (47) than in the comparison group (57) [52]. In another study, depression scores decreased from 8.00 to 4.00 in the experimental group ( $z = -2.22$ ,  $p < 0.05$ ), whereas no significant change was observed in the control group (8.33 to 9.67) [15]. In older couples with mild cognitive impairment, depression scores decreased from 1.33 at pretest to 0.67 at posttest following AAT [54].

In an AAT intervention conducted at a senior day-care center, a significant reduction in depression scores was observed in the experimental group ( $Z = -2.11$ ,  $p < 0.05$ ), whereas no change was observed in the control group [50]. In nursing home residents, depression scores in the experimental group began to decrease from the sixth session and showed a greater reduction after the twelfth session. In contrast, no significant change was observed in the comparison group [51].

Overall, AAT reduced depressive symptoms across different groups of older adults. It is a non-pharmacological and non-invasive intervention that increases oxytocin and decreases depression through several psychological and physiological mechanisms, including affective bonding, physical activity, social interaction, and emotional stability. The effects were also maintained among older adults with cognitive impairment or dementia. These findings indicate that AAT improves cognitive, emotional, and social functioning in older adults.

## PSYCHIATRIC, PSYCHOLOGICAL, SOCIAL, AND ENVIRONMENTAL FOUNDATIONS OF COGNITIVE FUNCTION

Cognitive function refers to the mental processes such as perception, memory, thinking, judgment, and problem-solving. It is essential for adaptation to the environment and social interaction. Aging is associated with physiological and psychological changes that affect multiple domains of cognitive function, including attention, memory, executive function, language ability, and visuospatial ability [55,56].

Age-related changes lead to declines in cognitive processing speed and working memory. However, not all domains decline uniformly. Both selective and divided attention decrease. Short-term and working memory decline, whereas semantic and procedural memory are relatively preserved. Moreover, executive functions such as problem-solving, planning, and inhibitory control gradually decline. Domains of language and vocabulary remain stable, whereas name recall and word-finding abilities become slower. Visuospatial abilities, including spatial perception and orientation, may also decline. Therefore, to mitigate such cognitive declines, it is essential to enhance cognitive reserve through intellectual activities and social engagement [57,58].

In neuropsychiatry, cognitive reserve is defined as the brain's adaptive capacity to delay or reduce the clinical expression of cognitive impairment despite brain damage or pathological change [55,59]. It reflects the efficiency and flexibility of neural networks. Two mechanisms have been proposed: neural reserve and neural compensation. Neural reserve maintains efficient function despite damage, whereas neural compensation recruits alternative pathways or brain regions. Cognitive reserve is therefore not a simple result of structural damage. It reflects lifelong intellectual and social experiences that influence brain efficiency and compensatory capacity [60,61].

### Tools for assessing cognitive function in older adults

Cognitive assessment in older adults is used to assess cognitive decline, mild cognitive impairment

(MCI), and dementia. It includes multiple domains such as memory, attention, executive function, language, and visuospatial ability. Global cognitive function is commonly assessed using the mini-mental state examination (MMSE), the montreal cognitive assessment (MoCA), the Addenbrooke’s Cognitive Examination–Revised/ACE-III (ACE-R/ACE-III), and the cognitive assessment screening instrument (CASI) [62–65]. Specific cognitive domains are assessed using standardized instruments. It includes the Rey auditory verbal learning Test (RAVLT), the Wechsler memory scale (WMS), the trail making test A and B (TMT-A/B), the Digit Span Test (forward/backward), the Stroop Color–Word Test, the Wisconsin card sorting test (WCST), the Clock Drawing Test, the Boston naming test (BNT), the Semantic Fluency Test, the Rey–Osterrieth Complex Figure Test, and the Block Design subtest of the WAIS [66–76]. Screening tools for dementia and cognitive impairment include the Korean dementia screening questionnaire (KDSQ), the CERAD Neuropsychological Battery, and the cognitive impairment screening test (CIST) [77–79].

Cognitive measures used to evaluate the effects of AAT include global cognitive assessments such as the MMSE and MoCA. Memory is assessed using the RAVLT and CERAD-K. Attention and executive function are assessed using the TMT-A/B and the Rey–Osterrieth Complex Figure Test. Multidimensional cognitive and emotional changes are assessed using the ACE-III combined with the MoCA. Standardized measures such as the CERAD-K and K-MoCA are also used (Table 3).

**Mini-mental state examination**

The MMSE, developed by Folstein et al. [80], is a global cognitive assessment tool. It assesses orientation, memory, attention, language, and visuospatial constructional ability. It is brief and easy to administer and is widely used for screening cognitive impairment and dementia. It is also used to evaluate overall cognitive changes before and after AAT interventions. Korean versions, including the K-MMSE and MMSE-DS, have been validated and are used in clinical and research settings [81].

**Table 3. Cognitive function assessment methods**

Assessment tools	Measurement methods	Assessment domains
MMSE, K-MMSE	<ul style="list-style-type: none"> <li>Examiner reads questions, and examinee responds verbally or through actions</li> </ul>	<ul style="list-style-type: none"> <li>Screens overall cognitive function, including orientation, memory registration and recall, attention, language, and visuospatial construction</li> <li>Widely used as an initial screening tool for dementia and cognitive decline</li> </ul>
MoCA, K-MoCA	<ul style="list-style-type: none"> <li>Examiner provides step-by-step instructions for task performance</li> </ul>	<ul style="list-style-type: none"> <li>More sensitive than the MMSE for detecting mild cognitive impairment (MCI).</li> </ul>
RAVLT	<ul style="list-style-type: none"> <li>Fifteen words are presented auditorily over five trials, followed by immediate recall after each trial</li> <li>An interference list is presented, followed by delayed recall and recognition memory tasks</li> </ul>	<ul style="list-style-type: none"> <li>Assesses changes in memory improvement or attentional performance</li> </ul>
TMT-A/B	<ul style="list-style-type: none"> <li>TMT-A: Examinee connects numbers (1–25) sequentially with lines</li> <li>TMT-B: Examinee alternately connects numbers and letters (1–A–2–B...) while completion time is recorded.</li> </ul>	<ul style="list-style-type: none"> <li>Measures attention, processing speed, working memory, and executive shifting ability</li> <li>TMT-B reflects frontal lobe executive functioning</li> </ul>
ROCF	<ul style="list-style-type: none"> <li>Examinee copies a complex figure by visually observing it</li> <li>Reproduction from memory is performed after a 3–30 minute delay</li> </ul>	<ul style="list-style-type: none"> <li>Assesses visuospatial constructional ability, visual memory, and planning/organizational strategies</li> </ul>
ACE-III, K-ACE	<ul style="list-style-type: none"> <li>Comprehensive cognitive test including verbal and visuospatial tasks</li> </ul>	<ul style="list-style-type: none"> <li>More detailed than the MMSE, assessing five cognitive domains: attention, memory, language, verbal fluency, and visuospatial ability</li> </ul>

MMSE, mini-mental state examination; K-MMSE, mini-mental state examination Korea version; MoCA, montreal cognitive assessment; K-MoCA, montreal cognitive assessment Korea version; RAVLT, Rey auditory verbal learning test; TMT-A/B, trail making test A and B; ROCF, Rey–Osterrieth complex figure test; ACE-III, Addenbrooke’s cognitive examination–III; K-ACE, Addenbrooke’s cognitive examination Korea version.

**Montreal cognitive assessment**

The MoCA, developed by Nasreddine et al. [65], is a cognitive screening tool. It assesses attention, executive function, visuospatial ability, language, memory, abstract reasoning, and orientation. It is more sensitive than the MMSE for detecting MCI. Therefore, it is used to detect subtle cognitive changes following AAT in older adults with MCI. The Korean version (K-MoCA) has also been developed and is used in clinical settings [82].

**Rey auditory verbal learning test**

The RAVLT, developed by Rey [83], assesses verbal learning and memory. It includes immediate recall, delayed recall, and recognition memory. It is one of the most widely used instruments for measuring improvements in memory functioning. It is also used to assess cognitive changes associated with AAT, including improved attention and memory following increased emotional stability.

**Trail making test A & B**

The TMT-A/B, developed by Reitan [84], is used to assess attention, processing speed, and executive functions, particularly cognitive switching. It is also used to evaluate cognitive flexibility and working memory. The TMT-A/B allows the quantification of improvements in attention and planning ability during AAT.

**Rey-osterrieth complex figure test**

The Rey–Osterrieth complex figure test (ROCF), developed by Osterrieth [85], is used to assess visuospatial ability, visual memory, and organizational strategies. It is also used to evaluate cognitive changes associated with AAT, including changes related to emotional engagement and social interaction.

**Addenbrooke's cognitive examination III**

The Addenbrooke's cognitive examination–III (ACE-III), developed by Hodges and Larner [63], is a multidimensional cognitive assessment tool. It is used to differentiate Alzheimer's disease (AD) from frontotemporal dementia (FTD). The ACE series has undergone several revisions. The original ACE (2000) assessed five domains: orientation, attention, memory, language, and visuospatial ability. The ACE-Revised (ACE-R, 2006) refined items and scoring criteria and strengthened language and memory components. The ACE-III (2012) removed MMSE items and was developed as an independent test. Additional versions include the ACEapp (2013), which supports automated scoring using digital devices, and the Mini-ACE (M-ACE, 2014), a short-form version. The Korean version (K-ACE) was developed by Suk et al. [86]. The ACE series is used as a multidimensional cognitive screening tool, addressing limitations of the MMSE. Further development of digital formats and short-form versions may expand its clinical and research applications.

## EFFECTS OF ANIMAL-ASSISTED THERAPY ON COGNITIVE FUNCTION IN OLDER ADULTS

To prevent cognitive decline in older adults and to maintain neuroplasticity, a multidimensional approach is required. This approach includes cognitive training, emotional stability, social stimulation, and physical activity [55]. AAT is an integrative intervention that stimulates psychiatric (emotional regulation), psychological (motivation and attention), social (interpersonal engagement), and biological (neuroplasticity) mechanisms. Compared with conventional cognitive

training, AAT provides a natural and sustainable environment for cognitive stimulation. It is a non-pharmacological intervention that strengthens the brain's adaptive and compensatory capacities. It also enhances therapeutic outcomes for preventive purposes, maintaining residual cognitive abilities in clinical settings [18,87].

Canine-assisted AAT improved cognitive function in nursing home residents. Specifically, cognitive scores in the experimental group increased from 23.16 ( $\pm$  2.73) at baseline to 24.63 ( $\pm$  2.06) at one week and 24.79 ( $\pm$  2.18) at four weeks after the intervention. In contrast, the scores in the control group were 23.65 ( $\pm$  2.64) at baseline to 23.80 ( $\pm$  2.28) at one week and 23.80 ( $\pm$  2.35) at four weeks after the intervention. The change was significant in the experimental group but not in the control group [12]. These findings suggest that AAT increased physical activity and stimulated cognitive function through activities such as feeding, walking, and interacting with animals [12]. In older adults with suspected mild cognitive impairment, MMSE-KC scores increased from 15 to 19 following AAT [49].

In an activity program with a companion dog administered to older adults with mild to moderate dementia in a long-term care facility, the experimental group showed improvement in cognitive function compared with the comparison group [52]. In another study of hospitalized older adults with dementia, cognitive scores in the experimental group increased from 15.83 at pretest to 18.50 at posttest. Significant improvements were observed in attention and calculation ( $z = -2.07, p < 0.01$ ) and language ( $z = -2.03, p < 0.05$ ) [15]. In older adults with mild neurocognitive disorder, the experimental group showed a significant improvement in overall cognitive function ( $Z = -2.207, p < 0.05$ ). Significant effects were also observed in naming ( $Z = -2.060, p < 0.05$ ) and language ( $Z = -2.000, p < 0.05$ ). In contrast, the control group showed no significant change ( $Z = -1.104, p > 0.05$ ) [88].

Overall, canine-assisted AAT improved cognitive function in older adults. Improvements were observed in cognitive subdomains such as attention, language, and naming. These effects are associated with increased physical activity (walking, caregiving, and playing), cognitive stimulation, and motivation through emotional bonding with animals. AAT also promotes social interaction and reduces depression and apathy. In Korea, cognitive outcomes in AAT studies are commonly measured using brief cognitive screening tools such as the MMSE-K and MMSE-KC. Improvements in attention, language, and calculation have been reported consistently. Overall, short-term programs (4–8 weeks) also showed improvement in cognitive function. AAT is a non-pharmacological intervention that mitigates cognitive decline in older adults with dementia and mild cognitive impairment (Table 4).

## DISCUSSION AND CONCLUSION

This study aimed to identify effective AAT programs for older adults and to evaluate practical and policy strategies by analyzing assessment tools for depression and cognitive function. The conclusions are as follows.

First, AAT reduced depression in older adults across multiple studies. Depression scores decreased significantly in the experimental groups, whereas no significant changes were observed in the control groups. These effects are associated with affective bonding, increased physical activity, social interaction, and emotional stabilization through increased oxytocin levels. Reductions in depressive symptoms were also observed in older adults with cognitive impairment and dementia. AAT improves cognitive, emotional, and social functioning. Various depression assessment tools, including the CES-D, PHQ-9, BDI, HAM-D, MADRS, SDS, and GDS-K, were used, indicating that AAT can be applied in different clinical and research settings.

**Table 4. Effects of AAT on cognitive function in older adults**

Researchers (Reference)	Participants (n)	AAT intervention method	Measurement tools and key findings
Shin et al. [12]	<ul style="list-style-type: none"> <li>Older adults aged 65 or older residing in a nursing home in Daegu (n = 41)</li> </ul>	<ul style="list-style-type: none"> <li>12 sessions, once weekly for 2 hours, nursing home residents</li> <li>Experimental group (n = 19), Control group (n = 22)</li> </ul>	<ul style="list-style-type: none"> <li>Pretest–posttest–follow-up assessment using the K-MMSE</li> <li>Key findings: Cognitive scores in the experimental group showed statistically significant improvement, whereas no significant change was observed in the control group</li> </ul>
Choi et al. [49]	<ul style="list-style-type: none"> <li>Older adults aged 65 or older suspected of mild cognitive impairment (n = 3)</li> </ul>	<ul style="list-style-type: none"> <li>15 sessions, once weekly for 30 minutes, older adults suspected of mild cognitive impairment</li> <li>Single-case experimental design; Experimental group (n = 3)</li> </ul>	<ul style="list-style-type: none"> <li>Pretest–posttest assessment using the K-MMSE</li> <li>Key findings: Word recall consistently improved during the intervention period, and verbal fluency and word recognition were maintained across sessions</li> </ul>
Kim et al. [52]	<ul style="list-style-type: none"> <li>Older adults aged 65 or older with mild to moderate dementia residing in a nursing home (n = 6)</li> </ul>	<ul style="list-style-type: none"> <li>12 sessions, twice weekly for 1 hour, nursing home residents with mild to moderate dementia</li> <li>Experimental group (n = 3), Comparison group (n = 3)</li> </ul>	<ul style="list-style-type: none"> <li>Pretest–posttest comparison using the CERAD-K evaluation items (K-MMSE, verbal fluency, Boston Naming, word list, constructional praxis, and constructional recall)</li> <li>Key findings: All participants demonstrated improvements in cognitive function following animal-assisted activities</li> </ul>
Lee et al. [15]	<ul style="list-style-type: none"> <li>Older adults aged 70 or older with dementia hospitalized in a geriatric hospital K (n = 12)</li> </ul>	<ul style="list-style-type: none"> <li>11 sessions, twice weekly for 60 minutes, dementia patients in a geriatric hospital</li> <li>Experimental group (n = 6), Control group (n = 6)</li> <li>Ethical considerations addressed</li> </ul>	<ul style="list-style-type: none"> <li>Pretest–posttest comparison using the K-MMSE</li> <li>Key findings: Significant improvements were observed in the experimental group in the subdomains of attention/calculation and language</li> </ul>
Jang et al. [88]	<ul style="list-style-type: none"> <li>Older adults with mild neurocognitive disorder attending a senior day-care center (n = 10)</li> </ul>	<ul style="list-style-type: none"> <li>12 sessions, once weekly for 50 minutes, older adults with mild neurocognitive disorder</li> <li>Experimental group (n = 6), Control group (n = 4)</li> <li>Ethical considerations addressed</li> </ul>	<ul style="list-style-type: none"> <li>Pretest–posttest measurement using the K-MoCA</li> <li>Key findings: The experimental group receiving AAT showed statistically significant improvements in cognitive function</li> </ul>

K-MMSE, mini-mental state examination Korea version.

Second, canine-assisted AAT improved overall cognitive functions across diverse older adult populations. Improvements were observed in nursing home residents, individuals with mild cognitive impairment (MCI), and those with mild to moderate dementia. Improvements were noted in specific cognitive subdomains such as attention, calculation, language, and naming. These effects are associated with increased physical activity (walking, caregiving, and play), cognitive stimulation, social interaction, and motivation derived from interaction with animals. Meaningful improvements were also observed in short-term programs (4–8 weeks). AAT is an effective non-pharmacological intervention that mitigates cognitive decline in older adults with dementia and MCI. Cognitive outcomes were measured using multidimensional assessment tools such as the MMSE, MMSE-KC, MoCA, ACE-III, RAVLT, TMT, and ROCF. These tools are suitable for quantitatively assessing AAT effectiveness.

Lastly, studies that included animal-mediated interventions were also reviewed, even when the term “AAT” was not explicitly used. Relevant studies were identified using multiple academic databases, Research Information Sharing Service (RISS), Koreastudies Information Service System (KISS), Korea Education and Research Information Service (KERIS), DataBase Periodical Information Academic (DBpia), E-article, Kyobo Scholar, Korean Social Science Data Center (KSDC DB), Korean Science (Korea Institute of Science and Technology Information [KISTI]), National Discovery for Science Library (NDSL), National Assembly Library, and Google Scholar, among others (as of September 1, 2025). Additionally, various keywords related to animal-assisted interventions were used in the search process. These keywords include animal mediation, animal mediation activity, animal mediation program, companion animal mediation therapy, companion animal mediation activity, pet mediation activity, pet mediation therapy, mediation dog use, animal sympathizing activity, animal mediation education, animal mediation healing, and animal auxiliary therapy, among others.

In conclusion, AAT for older adults functions as a non-pharmacological intervention that simultaneously promotes emotional stability, cognitive enhancement, increased social participation, and greater physical activity. It is applicable for both preventive and therapeutic purposes. Accordingly, future AAT programs should incorporate individualized designs based on personal health conditions and needs. Multidisciplinary intervention strategies are also required. Further research is also needed to examine long-term effects and cultural applicability. From a policy perspective, accumulating evidence on the effectiveness and safety of AAT is essential to support broader implementation in the fields of geriatric welfare, mental health, and rehabilitation.

This study has several limitations. Many studies had small sample sizes ( $n = 3-41$ ) and used non-randomized or single-group designs. Some studies used single-case approaches. While acknowledging these limitations, this review did not critically assess issues such as risk of bias, blinding, or control group adequacy. These factors should be considered in future research.

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