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Abstract

This study aims to present a more systematic and developmental research direction by classifying animal-medication-related research trends published in Korea. We analyzed the research trends of 68 domestic animal-medication programs published in 26 journals over the past 24 years under the premise of the necessity of animal-medication therapy, which considered a very effective intervention method in the practice areas of various subjects. Therefore, this study examines the year of publication of animal-medication-related research conducted in various academic fields from 1998 to 2022, research data sources, characteristics of research subjects, types of interventions and research topics, research design and intervention sessions, intervention methods, and ethical consideration statements. The results of this study are as follows: First, in the source of research and research trends by year, the number of papers published in animal-related societies was the highest at 34 (50%); the number of studies has been steadily increasing since the mid-2000s. Second, regarding research trends by subject, 45 (66%) were general subjects, 23 (34%) were medically diagnosed, 60 (88%) were selected through pre-evaluation, and 8 (12%) were requested. Third, regarding research trends by method, 27 (40%) of the pretests were conducted before and after the experiment-control group, and only 3 (4%) of the 68 papers were examined later. Fourth, regarding research trends by content, depression (25%) was the most frequently applied variable, and regarding intervention sessions, 53 (78%) were less than 12 sessions. Fifth, regarding research trends and ethical consideration statements by treatment approach method, 58 cases (85%) of individual treatment approaches and 10 cases (15%) of intervention approaches integrated with individual treatment approaches, and 23 cases (34%) of studies with ethical consideration statements or the Institutional Review Board's (IRB) approval. Based on the study results, the implications and research directions of animal-assisted therapy-related research are discussed.

Keywords: Animal-assisted therapy, Research trends, Literature review, Korea

Introduction

Animal-assisted therapy (AAT) is an intervention program that attracts not only general subjects but also those with special problems or needs, patients or their families, therapists, and researchers. It was also used as a preventive approach to non-educational, non-drug, and mediated therapy, as an effective way to intervene in various behavioral and psychological and emotional problems that people are experiencing [1]. Animal-mediated therapeutic effects include the recovery of physical and mental function through the improvement of motor function and self-expression ability and concentration, the promotion of interest and conversation, the improvement of play and recreation ability and self-esteem, the reduction of anxiety and worry and loneliness, the improvement of vocabulary and memory, and the recovery of educational function through the enhancement of visual concept and cognitive ability [2]. Korea, which has a high level of material civilization and a complex society, is in the age of 10 million pets and is a compound word for pets and families, "DINKpet," which is a family with companion animals instead of children; Human–Animal Bond (HAB) cultural movement is aimed at creating various new words such as, "Viewnimal people," who enjoy companion animal culture online.

AAT is an intervention program that intervenes at a wide range of levels where animals that meet specific criteria are an important part of the treatment process and is designed to encourage voluntary participation in the treatment to improve human physical, emotional, cognitive, and social functions, among others. Particularly, the importance of treatment is considered to be a very effective treatment method for subjects with various types of diagnoses occurring at each stage of life development, such as depression, dementia, and behavioral disorders [3].

AAT can be considered a complementary and alternative medicine therapy that uses living animals to obtain the healing effect of human subjects. In 1972, it was reported that William Tuke (1732–1822) was the first animal-assisted treatment to raise farm animals to care for mentally ill prisoners in York camps in England. In 1859, Florence Nightingale (1820–1910) recognized that pets could be effective partners in promoting the treatment of chronic illnesses and actively used them in nursing activities. Additionally, Freud (1856–1939) found that his dog was effective in relieving tension in the treatment room. Therefore, he applied an integration of counseling and AAT. However, at the time, animal-mediated treatment was not considered an authorized form of treatment [4].

The Global Emergence of AAT

The official use of AAT began in 1919 when the program was applied to St. Elizabeth in Washington City for treating soldiers suffering from mental illness after World War I, during which its effectiveness was verified. Since then, animals have been officially used as non-drug treatments in the United States to assist with medication. In 1942, the New York City Pauling Air Force Nursing Hospital was the first institution to use dogs. In the 1960s, Boris Levinson, an American psychiatrist, proposed to actively use AAT as an ancillary treatment for traditional independently without treatment. After the terms were first coined by Levinson in 1964, "pet therapy" was defined as an intervention that intentionally involves or incorporates animals as part of a therapeutic or improvement

process or environment [5].

Attempts at Early-stage AAT in Korea

In Korea, AAT began in 1990 when the Korean Animal Hospital Association applied the program "Animals are my friends," which was based on the activities of the American Delta Society. In 1992, the Korea Animal Mediation and Welfare Association (formerly Isaac Dog Training Center) began training Service Dogs for the Disabled; currently, the association trains animal psychologists. The Korea Sapsari Foundation has established a team of dogs in connection with the Department of Social Welfare at local universities. Since then, Samsung Everland has been working with people with mental or physical disabilities with the aim of improving their mood, leisure, and treatment. In 2002, the Samsung Therapeutic Dog Center was officially launched, and a full-scale therapeutic dog program centering on childcare facilities, geriatric hospitals, and mental hospitals. The Animal Mediation Therapy Research Society in 2006, the Korean Animal Mediation Psychotherapy Society in 2008, and the Animal Mediation Therapy Research Institute in 2010 were established to provide animal-assisted psychological counseling, training, and evaluation for therapeutic assistant animals, training animal mediators. It supports various programs. In 2008, Yonggwang Special School and Changpa Animal Mediation Center introduced Asia's first companion animal-mediation support service as part of their curriculum.

Development of Korea AAT

In Korea, Kim et al. [6] initiated the validation of the effectiveness of an animal-medication program. This program, introduced by Kim et al. [6], was applied to adolescents who had experienced interpersonal problems due to school violence. Subsequent studies applying the animal-medication program to various subjects and confirming its efficacy have been consistently published. AAT research has emerged as a valuable approach, emphasizing treatment methods to enhance the lives of patients with diverse conditions and clients with special needs. Additionally, it has shown potential for improving interpersonal relationships across various academic disciplines, including veterinary medicine, health supplementation, social sciences, pedagogy, nursing, humanities, sociology, special education rehabilitation, and psychology. By analyzing the trends of these animal-medication studies, effective program directions can be presented. From the 1960s, the contribution of the journals and researchers was analyzed by providing specific years, classification by editors, and comparison means to further comprehensively analyze contents. Since then, researchers have been incorporating details such as the publication year, information source, content, methodology, and settings. More recently, they have also adopted a systematic method to analyze papers and their content for specific research objectives [7]. Therefore, it is necessary to identify the research trends of animal-medication therapy, which has been proven to be effective in increasing the desire for program intervention and in the holistic aspect of the client group as well as the general public and seek concrete developmental directions.

Research Trends of AAT in Korea

To date, there have been limited studies on animal-medication research trends in Korea, and it has only recently begun being conducted. Kang and Jang [8] comprehensively analyze the trends of animal-assisted intervention research using 32 therapeutic helper animals published in domestic journals from 2017 to May 2021Kim et al. [9] conducted a study where they selected a total of five domestic academic journals and theses published between 2011 and 2021. Their research focused on examining trends in AAT studies related to social communication for children with autism spectrum disorders. They analyzed these studies based on the intervention techniques and effects employed in AAT. Jang [10] finally selected six books from 2011 to 2020, analyzed the domestic research trend of animal-assisted intervention for the subjects with autism spectrum disorder, and further analyzed the number of publications, age of the subjects, program sessions, and dependent variables. Ryu et al. [11] conducted an analysis based on publication year, program type, age of research subjects, type of research subjects, and intervention effects. Their aim was to comprehend research trends using a dataset of 69 domestic and 123 foreign journal articles and theses published between 2011 and 2021. This analysis sought to provide insights into the evolving landscape of animal-mediated research targeting children and adolescents. In a similar vein, Lee [12] aimed to understand research trends in animal-assisted activities and treatment for students with disabilities. The study involved analyzing 29 papers from domestic journals spanning 2010 to 2020. The analysis took into account the year of presentation, research subjects, research methods, animal-assisted activities, and treatment programs.

Necessity of Trend Analysis of AAT in Korea

While the number of studies verifying the effectiveness of AAT is increasing, systematic and integrated trend research is not being conducted appropriately. Therefore, trend analysis research is necessary. It will be an opportunity to identify the trends of research that can complement the existing limitations, ascertain the deficiencies, suggest directions for future research, and provide systematic and quality treatment programs. Additionally, it is necessary to systematically analyze research trends based on previous studies applying animal brokerage programs in Korea because practical experimental studies beyond the theory are insufficient, and the causal relationship between theory and practice is not clarified.

Accordingly, this study aims to analyze the overall trend of papers published in academic journals from the late 1990s to 2022, when animal-medication programs began in various domestic environments, and to suggest directions for academic and practical development regarding the application of convergence. The research questions to achieve this study's objectives are as follows. First, what is the source and yearly research trend of animal-medication research in Korea? Second, what is the research trend of animal-medication research in Korea? Third, what are the research trends of each method of animal-medication research in Korea? Fourth, what are the research trends of each content of animal-medication research in Korea?

An Analysis of AAT in Korea

1. Thesis selection criteria and data collection

This study uses the following criteria and search methods to select papers that meet the purpose of the study. First, the papers included in the analysis were published in domestic journals published from late 2000 to October 2022, when AAT began in earnest. Although AAT in Korea has been increasing in various environments since the 2000s, it has been difficult to analyze research trends. Based on Kil [13], this study aims to identify research trends and present empirical verification effects by analyzing intervention effects such as research time, segmented areas, and specific topics of animal-medication therapy. Second, only the articles published in academic journals in Korea were included in the analysis to secure the qualitative level of the analytical papers, including only the academic papers subject to rigorous examination. Further, previous studies show that these are excluded from the analysis because there is a difference in level between degrees. Third, only the thesis that verified the effectiveness of intervention with the intervention program using the dog, which is the most effective treatment assistant animal for animal-assisted treatment, was applied to the scope of analysis. Additionally, based on Kil [13], the possibility of the multiple intervention approach was confirmed by including the areas of individual and integrated treatment approaches in the analysis study. Lastly, although the term "animal-assisted therapy" was not used, the thesis that used interventions that included animal-mediated factors was selected as the analysis target. Fourth, to secure the data included in the analysis of research trends, a list of related papers was secured using keyword search techniques in RISS, KISS, KERIS, DBpia, E-article, KyoboScholar, KSED DB, NewPaper, Korean Science (KISTI), NDSL, National Assembly Library, and Google Scholar, among others (as of October 30, 2022). Additionally, related research was searched by linking animal mediation, animal mediation activity, animal mediation program, companion animal mediation therapy, companion animal mediation activity, pet mediation activity, pet mediation therapy, pet mediation activity, animal mediation, animal mediation activity, animal mediation activity, mediation dog use, animal sympathizing activity, animal mediation education, animal mediation healing, and animal auxiliary therapy, among others. Lastly, the references of the provisional papers were reviewed through the procedure method to confirm whether the papers with the possibility of selection were excluded. <Figure 1> presents the results.

2. Methods of analysis

A total of 72 papers were selected for the analysis of research trends. The analysis framework was further categorized based on previous studies analyzing research trends. The frequency and percentage were obtained using the Microsoft Excel Program, and codes were added to classify related elements, or examples of individual classification were modified based on an integrated approach. Additionally, to improve the accuracy of the analysis, each category of the whole thesis, the contents of the code, and the examples of classification were analyzed several times, and the Coding Sheet was further produced.

3. Thesis analysis: Frame of reference

To collect papers that meet the purpose of the study, a research analysis framework was set up based on the criteria

used in research trend analysis in Korea and presented in Table 1. First, for the analysis by source and year, the research trends and trends were grasped after sorting the number by classifying the year when the animal-medication thesis was published. Based on the criteria suggested by Kil [13], Kang and Jang [8], this study analyzes the process of continuous development since the late 2000s when animal-medicated therapy began in earnest and the period and increasing trend when systematic and diverse approaches began to take place. Second, the analysis of each research subject was classified into the characteristics of the research subject and the selection of the research subject (simple request, related inspection). This classification was established using the analytical framework presented by Kil [14] and based on the specific analysis of pregnant women [15]. The analysis of research subjects was conducted with consideration for the fact that animal-mediated therapy, a non-drug treatment approach, is categorized and applied to both individuals in the general population and those with medical diagnoses. Third, the analysis of each research method was classified into intervention type (AAA, AAE, AAA, AAI, or others), research design (pre-post-single group, comparison before and after control group, case study, pre-post parallelism, etc.), and intervention object (infant, child adolescent, woman, adult, elderly, disabled, etc.). This classification was conducted according to the analysis framework for each research method presented by Kil [13], as well as Kang and Jang [8]. Fourth, the analysis for each research content was classified into the research topic and the intervention session. This study aims to provide important basic data for developing therapeutic programs and using research keywords to verify the effectiveness of therapeutic programs by examining the most frequently used variables and intervention sessions. The study is based on the study of Noh and Jeon [16], which emphasizes the importance of intervention sessions in verifying the effectiveness of the program. Fifth, the analysis by treatment approach method was classified into the individual and integrated treatment approaches. Based on this, Kil [15] suggested that the intervention method that integrates two or more individual activities in AAT can have a more positive effect. Shin et al. [17]. Based on the study, we have identified whether there is an ethical consideration statement or whether the Institutional Review Board (IRB) approves the ethical aspect of the study.

Analysis Results of the Korean AAT Articles

1. Research trends by source and year of research

Regarding the source and yearly distribution of animal-medication-related research in Korea, the research trend has been steadily increasing since the mid-2000s. Table 2 presents the analysis results. As a result of analyzing trends by source, it was found that most papers were included in 34 animal-related societies (50%), followed by 11 educational associations (16%), 8 therapeutic research associations (12%), 7 social science associations (10%), 4 disability associations (6%) and 4 others (6%).The research trends by year included one from 2000 to 2005, one from 2006 to 2010 (1.5%), 20 from 2011 to 2015 (29%), 34 from 2016 to 2020 (50%), and 12 from 2021 to October 2022 (18%).

2. Research Trends by Subject

As shown in Table 3, 45 (66%) of the subjects were general subjects, while 23 (34%) were medically diagnosed. Mental disorders such as autistic developmental disorder, autism spectrum, intellectual disability, ADHD, mild cognitive impairment, dementia, schizophrenia, etc., have been medically diagnosed, and research on animal-mediated treatment has been actively conducted for the past 10 years. Regarding the method of selecting the subjects, 60 studies (88%) were conducted through evaluation, and 8 (12%) were conducted by referral, and more studies were conducted by related evaluation than those conducted by referral for the last 10 years.

3. Research Trends by Method

As presented in Table 4, the most common types of interventions were AAT 26 (38%), Animal-Assisted Intervention (AAI) 14 (21%), Animal-Assisted Activity (AAA) 13 (19%), and Animal Assisted Education (AAE) 6 (9%). Regarding the trend of research experimental design, 27 (40%) of the pretest-control group pretest was the most, followed by 22 (32) of the single pretest, and 18 (26%) of the case study and pretest. The subjects of intervention were 40 (59) children and adolescents, 15 (22%) disabled, and 7 (10%) elderly. Additionally, infants, women, adults, correctional subjects, and college students were included as subjects. Regarding the research trend, according to follow-up examination, 3 papers (4%) were followed up, while 65 (96%) were not.

4. Research Trends by Contents

The frequency of keywords dealt with in the subject of analysis was classified by year, and the research trend according to the research topic was further analyzed; this is presented in Table 5. A total of 25 studies examined the effects of intervention with depression as a variable, including 6 from 2011 to 2015, 7 from 2016 to 2020, and 2 from 2021 to October 2022, followed by 11 from sociality, and 10 from self-esteem. Additionally, personality (6), social skills (5), and respect for life (4) were in order. Regarding research trends according to treatment intervention sessions, as shown in Table 6, 53 (78%) were less than 12 sessions, 13 (19%) were 13–20 sessions, and 2 (3%) were more than 21 sessions.

5. Statement of research trends and ethical considerations by treatment approach method

Regarding research trends according to treatment approach, as shown in Table 7, demonstrate 58 (85%) of individual animal-mediated treatment approaches and 10 (15%) of studies integrated animal-mediated play therapy, healing agriculture program, bibliotherapy, art therapy, creative experiential activities, praise therapy, and personality education. Consequently, although individual treatment approaches still occupied the majority, it was found that complex intervention studies incorporating two or more individual treatment approaches, including animal-mediated treatment, are gradually increasing. Regarding research trends according to ethical consideration statements, as shown in Table 8, 23 (34%) studies had ethical consideration statements or were approved by the IRB considering the ethical aspects of the study. Forty five (66%) studies did not state ethical considerations. There has been an increasing trend of papers stating ethical considerations from 2011 to date.

Discussion

Since the early 2000s, many studies on animal medication have been conducted. However, systematic and integrated research on the thesis trends that applied animal medication to various subjects and verified its effectiveness is still lacking. Based on the research trends of AAT as described above, the following limitations are to be overcome. First, dogs, which are therapy animals with strong ties to humans, play a role in healing and treatment as assistants for subjects suffering from psychological and emotional difficulties. The most commonly used animal as a therapeutic helper is a single animal, which meets the four conditions of selection, training, hygiene, and animal welfare most easily. These preconditions enable excellent mutual communication with humans and optimal utilization. Additionally, the dog, which is a therapeutic assistant animal, has characteristics such as mutual contact, emotional communication, human mobility, and animal pleasure, consequently acting as a mediator represented by living animals. Moreover, it can induce active participation and a rapid therapeutic effect due to the possibility of quick interaction. The analysis of research trends has encompassed various animals used in animal mediation, such as dogs, cats, horses, fish, reptiles, rabbits, and insects. However, a significant research focus and trend have been observed in animal mediation research specifically involving dogs, which has been actively studied since 2000. Secondly, due to the limited availability of analytical papers, most of the existing research trends, comprising both master's and doctoral theses as well as journal articles, were included in the analysis. However, the scale that can evaluate the current status and development of each discipline is best reflected in the journals. Therefore, only the papers published in journals were selected and analyzed to improve the quality of future research by excluding duplicated or plagiarized research contents. Thirdly, because the fragmentation of the analytical framework that can contribute to practical studies is insufficient, I attempted to construct a systematic analytical framework and derive meaningful results by referring to previous papers that conducted research trends in various disciplines that attempted treatment approaches to various subjects. Fourth, to supplement the limitation that the intervention effect for the change of the subjects was not grasped in the existing research trend, the research topic was classified and analyzed by year to grasp the variables that were most used in animal medication and effective for change. Fifth, in several studies that verified the effectiveness of the AAT program through intervention, Kil et al [1]. Reflecting the results of previous studies, new approaches were attempted by classifying them into individual treatment approaches (animal-mediated individual treatment approaches) and integrated treatment approaches (integrated treatment approaches including animal-mediated approaches). Additionally, all human clinical studies must comply with ethical considerations so that the general audience and patients have the right to privacy. Therefore, the authors must state that they have obtained prior consent to what is posted in the paper. The authors, who used animals for human treatment, analyzed whether evidence that they had received ethical or legal approval before conducting the study.

The main results of the study are as follows. First, as a result of analyzing research trends by source and year, it was confirmed that the interest and awareness of research related to AAT is expanding to various areas, and the number of research articles is steadily increasing. However, it is necessary to expand the research related to animal-mediated treatment, which mainly examines animal-related fields, to various fields such as social welfare, education, nursing, psychology, and counseling. Secondly, as a result of analyzing research trends by subject, 45

papers covered general topics, while 23 papers focused on specific medical diagnoses, including autistic developmental disorder, autism spectrum disorder, intellectual disability, ADHD, mild cognitive impairment, dementia, and asthma. Over the last 10 years, more studies have been conducted through related evaluations than through referrals. Our analysis of research trends by subject has highlighted a growing interest in non-drug treatments, particularly emphasizing animal-mediated therapies. This research has targeted both patients with these medical diagnoses and preventive approaches. Furthermore, it is crucial to carefully select subjects through pre-evaluation during program planning. Thirdly, our analysis of research trends by method reveals that intervention types were the most commonly used. To assess the effectiveness of intervention applications and ensure their adaptability to the rapidly changing social landscape, it is crucial to align the intervention type with the intervention target and select a scientifically rigorous experimental design method for research experiments. Furthermore, it's worth noting that most studies related to animal-mediated therapy in Korea have not conducted follow-up tests. As pointed out by Kil [13], addressing these issues is necessary to verify the effectiveness of animal-mediated therapy in post-assessment and to determine how long its desired effects last. These findings will allow for a clearer presentation of the effects of animal-mediated research. Fourthly, in our analysis of research trends by content, we found that the most frequently used term in animal-mediated research was 'depression.' Depression is a prevalent emotional disorder experienced by many individuals. To maximize the potential benefits of animal-mediated interventions and prevent depressive mood states from progressing into pathological conditions, it is advisable to integrate a depression improvement program with an AAT program. This integrated approach can help prevent or alleviate depression, a common negative emotion experienced in daily life, and address the life problems and conflicts associated with chronic depression. Fifthly, in our analysis of research trends and ethical consideration statements using the treatment-approach method, we observed that individual treatment approaches still dominate. However, it's worth noting that there is a gradual increase in complex intervention studies that incorporate two or more individual treatment approaches, including animal-mediated treatment. Additionally, there has been a growing trend of papers including ethical considerations from 2011 onwards. Based on the findings of Kil [2], who suggests that multiple interventions are more effective due to the steady rise of integrated treatment approaches, we anticipate that this approach will play an active role in shaping integrated treatment programs, including animal-mediated treatment, across various fields in future studies. Furthermore, we expect ongoing development and research efforts to provide experts and programs that can be applied to complex interventions in the long term. In the context of ethical consideration statements, it's worth noting that most domestic and international journals in the field of medicine and health require the inclusion of an ethics approval statement for experiments involving human subjects. Such statements must receive approval from the Ethics Committee or the IRB before research commences. The IRB's primary aim is to ensure the protection of human participants as experimental subjects. Ethical consideration statements should continue to be a crucial aspect of future studies related to animal-mediated treatment.

Conclusion

This study holds significance in its analysis of recent research trends in animal-medication-related studies that have intervened across various subject areas. It offers both academic insights and practical implications for the

289 expansion of multidisciplinary practices. However, it's important to note that this study has limitations. Notably,
290 it does not incorporate the editor's classification, the researcher's contributions, the provision of means for
291 comparison, or an assessment of bias risks.

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REFERENCES

1. Kil TY, Yoon KA, Ryu HS, Kim MK. Effect of group integrated intervention program combined animal-assisted therapy and integrated elderly play therapy on live alone elderly. J Anim Sci Technol. 2019;61(6):379-387. https://doi.org/10.5187/jast.2019.61.6.379

2. Kil TY. Effects of the multimodal intervention program including animal-assisted therapy on depression and self-esteem among university students. J Anim Sci Technol. 2021;63(6):1443-1452. https://doi.org/10.5187/jast.2021.e115

3. Jung SG. Study of how the dog intermediate treatment can help reducing violent of the juvenile delinquents (Research based on The Chun An Juvenile Prison). 2007;37:238-270. https://doi.org/10.14819/krscs

4. Shin JI, Kang YK. Introduction of AAT (animal-assisted therapy) and implication of applying AAT in counseling. 2016;1:191-224. https://doi.org/10.15870/jsers.2016.03.55.1.191

5. Kruger KA, Serpell JA. Animal-assisted interventions in mental health: Definitions and theoretical foundations. In A. H. Fine (Ed.), Hand book on animal-assisted therapy: Theoretical foundations and guidelines for practice, San Diego, CA: Academic Press. 21-38. https://doi.org/10.1016/B978-0-12-381453-1.10003-0

6. Kim SC, Noh HL, Choi IS. A study on the effect of animal assisted program on an adolescent with problems in interpersonal relationships owing to school violence. 1998;6:85-99.

7. Blancher AT, Buboltz Jr WC, Soper B. Content analysis of the journal of counseling & development: volumes 74 to 84. J Counseling & Development. 2010;88: 139. https://doi.org/10.1002/j.1556-6678.2010.tb00002.x

8. Kang WG, Jang YG. Trends in research on therapeutic helpers used in domestic Animal Assisted Intervention. J Animal Assisted Psychotherapy. 2021;10:13-7. https://doi.org/10.16896/kaaap.2021.10.1.13

9. Kim CE, Jang YS, Kang WG. Trends in research on social communication animal-assisted therapy in children with autism spectrum disorder. J Korean Association of Animal Assisted Psychotherapy. 2021;10:51-5. https://doi.org/10.16896/kaaap.2021.10.2.51

10. Jang YS. Research trends in animal assisted intervention for autism spectrum disorders. J Animal Assisted Psychotherapy. 2021;10:25-9. https://doi.org/10.16896/kaaap.2021.10.1.25

11. Ryu YJ, Park HR, Lee HA. AAI domestic and international academic journals and degree thesis research trends analysis of children and adolescents. J Animal Assisted Psychotherapy. 2021;10:57-79. https://doi.org/10.16896/kaaap.2021.10.2.57

12. Lee JH. Trends in animal assisted activities and therapy related research for the students with disabilities: domestic journals. J Emotional & Behavioral Disorders. 2021;37:265-281. http://dx.doi.org/10.33770/JEBD.37.1.12

13. Kil TY. Analysis of Research Trends of Play Therapy for the Elderly: Focusing on Domestic Researches Since 2000. J Future Social Work Research. 2018;9:39-70. http://dx.doi.org/10.22836/kaswpr.2018.9.2.39

14. Lee JS, Lim SJ. An analysis of the research trends of the preschool children psychotherapy in Korea (2000~2012). Korean J Child Psychotherapy. 2013;1:47-69. http://dx.doi.org/G704-SER000008900.2013.8.1.002

15. Kil TY. The effectiveness verification of integrated elderly play therapy for the older people living alone in a urban and rural complex area: focusing on the depression and interpersonal relationships. Korean J Gerontol Soc Welf. 2017;72:115-40. https://doi.org/10.21194/kjgsw.72.4.201712.115

16. Roh SE, Jun NH. A study on the effectiveness of the leisure welfare program for the elderly: recreation, therapeutic recreation, play therapy. Korea Academy of Care Management. 2018;26:111-134. http://dx.doi.org/10.22589/kaocm.2018.26.111

17. Shin SS, Woo KS, Shin YJ. A systematic review of studies on public health using multi level analysis: focused on research trends and the assessment of risk of bias. Health and Social Welfare Review. 2015;35:157-189. http://dx.doi.org/10.15709/hswr.2015.35.4.157

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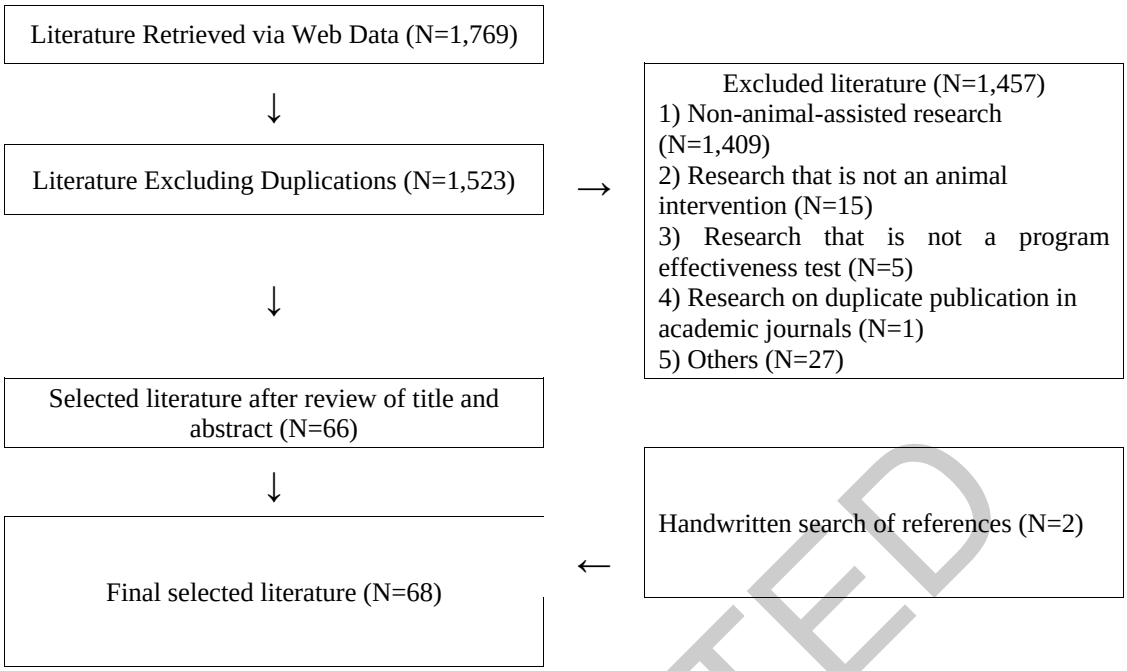

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345 **Figure 1. Analytical literature extraction process**

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349 Table 1. Characteristics of Included Studies

Research Classification	Contents	Criteria according to previous studies
Source and Year	Classification by relevant journals from early 2000 to 2022	〔13〕 〔8〕
Research subject	Characteristics of research subjects, selection of research subjects (simple referrals, conducting related tests, classification as unregistered)	〔14〕, 〔13〕
Research method	Intervention type: Animal-assisted therapy (AAT) · Animal-assisted education (AAE) · Animal-assisted activity (AAA) · Animal-assisted Intervention (AAI) · or Others	〔13〕 〔8〕
	Research design: · Single group pretest–posttest · Comparison between before and after the experiment-control group · Case study & pre-post parallelism · Other	
	Interventions (infants, children and adolescents, women, the elderly, persons with disabilities, etc.)	
	Follow-up test execution whether or not	
Research content	Research keywords (depression, self-esteem, sociality, etc.)	〔13〕 〔16〕 〔17〕
	Intervention sessions Intervention duration (weeks)	
Treatment approaches and Statement of ethical considerations	·Therapeutic approach ·Individual treatment access (animal-mediated individual treatment access) ·Integrated treatment access (integrated treatment access including animal mediation)	
	Statement of ethical consideration ·No ·Yes	

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354 Table 2. Research trends by source and year

Related journals	Distribution and trend by source and year					No. of articles (%)
	2000~2005	2006~2010	2011~2015	2016~2020	2021~2022	
Animal research			14	17	3	34 (50)
Education research			1	5	5	11 (16)
Therapeutic research			3	5		8 (12)
Social science research		1		4	2	7 (10)
Disability research	1		1	2		4 (6)
Others			1	1	2	4 (6)

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Table 3. Research trends according to research subjects

Research subject		Distribution and trend by year					Summation (%)
		2000~ 2005	2006~ 2010	2011~ 2015	2016~ 2020	2021~ 2022	
Characteristic	General		1	10	24	10	45 (66)
	Diagnosed	1		10	10	2	23 (34)
Preselection	Requesting	1		6	1		8 (12)
	Evaluation		1	14	33	12	60 (88)

373 Table 4. Research trend according to research method

Research method		Distribution and trend by year					Summation (%)
		2000~ 2005	2006~ 2010	2011~ 2015	2016~ 2020	2021~ 2022	
Intervention types	Animal-Assisted Therapy (AAT)			9	12	5	26 (38)
	Animal-Assisted Intervention (AAI)			6	6	2	14 (21)
	Animal-Assisted Activity (AAA)	1		4	8		13 (19)
	Animal-Assisted Education (AAE)			1	4	1	6 (9)
	Others		1		4	4	9 (13)
Designing	Single experiment pretest-posttest			6	12	4	22 (32)
	Group-control pretest-posttest		1	6	12	8	27 (40)
	Case Study & Pre and Post-test parallel			8	10		18 (26)
	Others	1					1 (2)
Intervention object	Infants and young children				1	1	2 (3)
	Children and adolescents	1	1	10	23	5	40 (59)
	Female			1			1 (1.5)
	Adult			1			1 (1.5)
	Old people			2	3	2	7 (10)
	Disabled person			6	7	2	15 (22)
	Others					2	2 (3)
Follow-up test	Yes			2		1	3 (4)
	No	1	1	18	34	11	65 (96)

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377 Table 5. Research keywords

Classification by year		Research keyword (No. of Articles)
Distribution and trend by year	2000~2005	Sociality (1)
	2006~2010	Aggression (1)
	2011~2015	Depression (6), Sociality (5), Self-esteem (2), Cognitive ability (2), Aggression (2), Interpersonal relationship (1), Family bond (1), Anger (1), Impulsivity (1), Social responsiveness (1), Blood pressure (1), Stress (1), Reading promotion (1), Social skills (1), Problem behavior (1), Anxiety (1), Self-concept (1), Interaction with friends (1), Emotional intelligence (1), School adjustment (1), Emotion (1)
	2016~2020	Depression (7), Self-esteem (6), Sociability (4), Respect for life (4), Personality (4), Social skills (3), Interaction with friends (3), Self-expression (3), Cognition (2) , Anxiety (2), Happiness (2), Self-efficacy (2), Emotional intelligence (1), Conduct disorder (1), ADHD (1), Empathy (1), Self-regulation (1), Behavior problems (1), Prosocial behavior (1), Stress (1), Suicidal ideation (1), Prosociality (1), Learning participation (1), Reading attitude (1), Social interaction (1), Attention (1) , Language ability (1), School adjustment (1), Emotional stability (1), Interpersonal relationship (1), Language and behavior (1), Emotional regulation (1)
	2021~2022	Depression (2), Self-esteem (2), Emotional intelligence (2), Personality (2), Sociability (1), Interaction with friends (1), Parenting stress (1), Parenting efficacy (1), Interpersonal relationship (1) , Happiness (1), Creative personality (1), Social skills (1), Brain function index (1), Anxiety (1), Subjective well-being (1), Stress (1), Attachment to friends (1), School life adaptation (1)

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380 Table 6. Intervention session

Research content		Distribution and trend by year					Summation (%)
		2000~ 2005	2006~ 2010	2011~ 2015	2016~ 2020	2021~ 2022	
Intervention session	Less than 12 sessions	1	1	13	28	10	53 (78)
	13~20 sessions			7	5	1	13 (19)
	More than 21 sessions				1	1	2 (3)
Summation (%)		1 (1.5)	1 (1.5)	20 (29)	3 4(50)	12 (18)	68 (100%)

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388 Table 7. Research trends according to treatment approach

Approach methods	Distribution and trend by year					Summation (%)
	2000~ 2005	2006~ 2010	2011~ 2015	2016~ 2020	2021~ 2022	
Individual treatment	1	1	17	29	10	58 (85)
Integrated treatment			3	5	2	10 (15)

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393 Table 8. Research trends according to the statement of ethical considerations

Ethical Considerations Statement	Distribution and trend by year					Summation (%)
	2000~ 2005	2006~ 2010	2011~ 2015	2016~ 2020	2021~ 2022	
No	1	1	16	23	4	45 (66)
Yes			4	11	8	23 (34)

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403 Appendix1. Studies included in Systematic Review (68 studies)

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405 A1. Yoo JY, Jeon BU. On the application of programs utilizing pet dogs to educate children with developmental
406 delays. J Korean Association for Persons with Autism. 2003;4:163-184.

407 A2. Jung SG. Study of how the dog intermediate treatment can help reducing violent of the juvenile delinquents
408 (Research based on The Chun An Juvenile Prison). 2007;37:238-270. https://doi.org/10.14819

409 A3. Song YO, Kim JS, Cho JH, Park BK, Kim CH. The effects of animal-assisted therapy on aggression and
410 depression of children of family violence women victims. Korean J Play Therapy. 2011;14:93-105.
411 https://doi.org/ UCI: G704-SER000000779.2011.14.3.006

412 A4. Choi DY, Lee HA, Hong SH, Ma YN, Kim OK. Effects of animal assisted activity program on recognition in
413 children with autism. J Life Science and Natural resources Research. 2011;33:80-6

414 A5. Park HJ, Kim CH. The effects of an animal-assisted therapy (AAT) program on depression and self-esteem
415 of adolescents as victims of school violence. Korean J Veterinary Service. 2012;35:327-332.
416 http://dx.doi.org/10.7853/kjvs.2012.35.4.327

417 A6. Ma YN, Kim OJ. The influences of animal-assisted therapy on the interpersonal relations of elementary school
418 student. J Korean Association of Animal Assisted Psychotherapy. 2013;1:41-9.

419 A7. Kim W. The influence of animal-assisted intervention using stray dog on the social improvement of a child
420 with autism and his family bonds. J Korean Association of Animal Assisted Psychotherapy. 2013;1:17-34.

421 A8. Kim W, Ma YN, Shin HG. Effectiveness of animal-assisted intervention program on depression, anxiety,
422 anger of primary school upper graders. J Emotional & Behavioral Disorders. 2013;12:245-271.
423 http://dx.doi.org/G704-000501.2013.29.4.013

424 A9. Seo KO, Kim OJ. The Effects of animal assisted therapy program using therapy dog for the impulsivity of
425 children with ADHD. J Korean Association of Animal Assisted Psychotherapy. 2013;2:9-13.

426 A10. Woo JG, Kim OJ. Effects of animal assisted therapy program on the social reactivity in children with autism.
427 J Korean Association of Animal Assisted Psychotherapy. 2013;2:15-21.

428 A11. Jung SG, Kim HJ, Lim SR, Lee HA, Kim OJ. The effects of animal assisted therapy program on the blood
429 Pressure and stress of hypertension patients. J Korean Association of Animal Assisted Psychotherapy.
430 2013;2:11-6.

431 A12. Jung SG, Kim HJ, Lim SR, Hong SH, Kim OJ. The effect of animal assisted therapy program on the stress
432 of old patients. J Korean Association of Animal Assisted Psychotherapy. 2013;2:17-22.

433 A13. Her SY, Hong HJ. Study about the effect of reading enhancement and the self respect improvement of
434 children through an animal assisted therapy. J Korean Biblia Society for Library and Information Science.

2013;24:181-198. https://doi.org/10.14699/kbiblia.2013.24.3.181

A14. Kim KM. The effects of animal assisted activity program via parents on social skills and problem behaviors for young children with autism spectrum disorder. Korean J early childhood special education. 2014;3:1-24.

A15. Lee SJ, Kim DS, Kim SM, Mun MN, Gu NJ, Kim AR, Pak HJ, Song MS, Yu HY, Lee S, Kim OJ. A pilot study of animal assisted therapy in elementary school-case report of hongcheon elementary school. J Animal Assisted Psychotherapy. 2014;3:113-134. http://dx.doi.org/10.16896/kaaap.2014.3.2.113

A16. Choi SY, Seong CH, Hong EJ, Han SW. Effects of animal-assisted activity for korea elderly with mild cognitive impairment -single subject design-. The J Occupational Therapy for the Aged and Dementia.2014;8:11-19. I410-ECN-0102-2015-500-002148096

A17. Kang WG, Do JG, Ham JS, Park DG, Kim MH, Lee JY, Kim HJ, Kim OJ. The effects of animal assisted activity program on the social skills of schizophrenia patients. J Korean Association of Animal Assisted Psychotherapy. 2015;4:59-68. http://www.dx.doi.org/10.16896/kaaap.2015.4.1.page5

A18. Kim HJ, Kim OJ. Changes of shrink children's peer interactions through animal assisted intervention program -focused on school age children-. J Korean Association of Animal Assisted Psychotherapy. 2015;4:27-34. http://www.dx.doi.org/10.16896/kaaap.2015.4.3.page10

A19. Lee YJ, Kim OJ. Effects of animal assisted therapy with integrative art activities applied to on children's sociality –focused on local child support center. J Korean Association of Animal Assisted Psychotherapy. 2015;4:15-25. http://www.dx.doi.org/10.16896/kaaap.2015.4.3.page15

A20. Im EK, Kim OJ. Effects of animal-assisted intervention program on the emotional intelligence and sociability of middle School. J Korean Association of Animal Assisted Psychotherapy. 2015;4:51-63. http://www.dx.doi.org/10.16896/kaaap.2015.4.3.page5

A21. Chang OK, Kim OJ. Effects of animal assisted intervention on school adjustments and social skill developments of children neglected by violent parents. J Korean Association of Animal Assisted Psychotherapy. 2015;4:73-84. http://www.dx.doi.org/10.16896/kaaap.2015.4.3.page73

A22. Jung HS, Oh GY. Effects on the children's emotion of single-parent family by the group art therapy using animal-assisted activities. The Korean J Arts Therapy, 2015;15:1-18. http://dx.doi.org/10.18253/kart.2015.15.1.01

A23. Kim TK, Kim YM. Companion animals mediated activity program impact on five-years-old infant's emotional intelligence. Korean journal of youth studies. 2016;23:321-344.

A24. Kim CT, Lee DH. A study on the effect of animal assisted therapy on the elderly's depression, cognition - focusing on kyungbuk uisung nursing home. J Animal Assisted Psychotherapy. 2016;5:67-78. https://doi.org/10.16896/kaaap.2016.5.2.67

A25. Kang WG, Lee MY, Jung TM, Hong JH, Lim SY, Moon MN, Won JS, Kim HJ, Kim OJ. Effect of animal assisted intervention on the life-respect attitude in elementary school students. J Animal Assisted

Psychotherapy. 2016;5:31-41. http://www.dx.doi.org/10.16896/kaaap.2016.5.1.page 1

A26. Kang WK, Lim SY, Lee SJ, Kim JY, Lee HS, Kim OJ. Effects of animal assisted education on the life-respect and psycho-emotional healing in elementary school students. J Animal Assisted Psychotherapy. 2016;5:23-29. http://www.dx.doi.org/10.16896/kaaap.2016.5.1.page23

A27. Lee YJ, Kim OJ. Effects of animal assisted intervention program on empathy and peer relation of children in community child Center. J Animal Assisted Psychotherapy. 2016;5:21-32. https://doi.org/10.16896/kaaap.2016.5.2.21

A28. Im EK, Kim OJ. Effects of animal-assisted intervention program on the sociability and depression of middle school students. J Animal Assisted Psychotherapy. 2016;5:53-65. https://doi.org/10.16896/kaaap.2016.5.2.53

A29. Chang OK, Effect of animal assisted intervention on self regulations and behavioral problems of elementary school students. J Animal Assisted Psychotherapy. 2016;5:33-51. https://doi.org/10.16896/kaaap.2016.5.2.33

A30. Choi DH, Son JH. The effect of the creative experience activities program using AAA on the personality of elementary school students. J Korean practical arts education. 2016;29:1-27.

A31. Kang KS, Lee MH, Woo JG. Effects of animal-assisted intervention with companion dogs on the social skills of adults with intellectual disabilities in facilities. J Intellectual Disabilities. 2017;19:45-75.

A32. Kim TK, Kim YM. The Effect of Animal-Mediated Group Counseling Program on Adolescents' Self-Efficacy and Prosocial Behavior. Korean J youth studies. 2017;24:515-537. http://dx.doi.org/10.21509/KJYS.2017.02.24.2.515

A33. Lee MJ, Kim SM, Hong JM, Lee SJ. The influence of animal assisted therapy on elders' depression, stress and suicide ideation. J Animal Assisted Psychotherapy. 2017;6:23-29. https://doi.org/10.16896/kaaap.2017.6.1.23

A34. Lim SY, Kang MJ, Jang OG, Lee EW. Effects of animal assisted education with companion dogs on life respects and prosociality of elementary school students. The J Play Therapy. 2017;21:143-158.

A35. Kang WG, Jang SM, Kim OJ. Study on animal-assited therapy regarding self-esteem and sociality of children from low-income families in rural areas. The J Rural Society. 2018;28:193-217. https://doi.org/10.31894/JRS.2018.06.28.1.193

A36. Kim MH, Kang WG, Kim HJ, An JW, Oh DR, Lee SY, Yang GH, Han IS, Kim HJ, Kim OJ. The effects of animal assisted activities program on the depression and self-expression in the elderly. J Animal Assisted Psychotherapy. 2018;7:33-42. https://doi.org/10.16896/kaaap.2018.7.2.33

A37. Kim JY, Kang WG, Lee YS, Shin JH, Kim MS, Kim SB, Lee SY, Jung SU, Hwang HJ, Kim OJ. Effects of animal-assisted therapy on self-esteem and peer relationship in lower grade elementary school children with atrophy. J Animal Assisted Psychotherapy. 2018;7:105-115. https://doi.org/10.16896/kaaap.2018.7.2.105

A38. Kim TH, Lee KS. A study on the participation of patients with adult intellectual disability in animal assisted therapy learning. Journal of Social Science. 2018;21:53-71. 10.31625/issdoi.2018.21.1.53

A39. Lee HS, Kang WG, Jang YS, Kim JN, So SJ, Moon SH, Jang JE, Kim OJ. Effects of animal-assisted therapy program on depression and happiness of schizophrenics. J Animal Assisted Psychotherapy. 2018;7:87-95. https://doi.org/10.16896/kaaap.2018.7.2.87

A40. Lee HS, Lee HA, Kim SM, Lee MJ, Lim HJ, Jeon SH, Jung HY, Choi YJ, Choi JH, Kim MH, Kim OJ. Effects of the animal assisted activity program on the reading behavior of the elderly in elementary school. J Animal Assisted Psychotherapy. 2018;7:51-64. https://doi.org/10.16896/kaaap.2018.7.2.51

A41. Kang WG, Kim JY, Kim SM, Kim HJ, Lee SH, Lim HJ, Jeon SH, Jung HY, Choi YJ, Kim OJ. The effects of animal assisted activities on self-respect and happiness in the upper grades in elementary school. J Animal Assisted Psychotherapy. 2019;8:1-14. https://doi.org/10.16896/kaaap.2019.8.1.1

A42. Ko HB, Kim EK. A case study of the animal-assisted therapy for the changes of social interaction of an elementary school student with autism spectrum disorder. J Special Education. 2019;35:1-29. https://doi.org/10.31863/JSE.2019.08.35.2.1

A43. Kim JY, Lee HA, Jang YS, Kim GR, Kim JN, Min GG, Park YR, Yu AR, Lee YS, Jung DE, Kim OJ. Effects of animal assisted education program on life-Respect consciousness and personality of third graders children in elementary school. J Animal Assisted Psychotherapy. 2019;8:29-39. https://doi.org/10.16896/kaaap.2019.8.1.29

A44. Kim HJ, Kim JY, Lee HA, Kim MH, Kim MS, Kim SY, Bae SB, Lee SY, Lee JS, Jang EJ, Choi YJ, Kim OJ. Effects of sensory stimulation through animal assisted activity on concentration and linguistic ability of children with intellectual disability. J Animal Assisted Psychotherapy. 2019;8:41-54. https://doi.org/10.16896/kaaap.2019.8.1.41

A45. Lee MH, Jo HJ, Min JW, Mun JI, Kim YG, Kim BS. Effects of animal assisted activity regarding social skill and self-efficacy of children in local children center. J Korean Home Management Association. 2019;8:35-41. https://doi.org/10.16896/kaaap.2019.8.2.35

A46. Lee SJ, Yoo JH, Kim OJ. Development and effects of animal-assisted play therapy programs for improvement of elementary school character education. J Animal Assisted Psychotherapy. 2019;3:143-162. http://dx.doi.org/10.7466/JKHMA.2019.37.1.143

A47. Lee HA, Kim HJ, Gu HS, Kim DJ, Kim SE, Kim JH, NO YH, Moon SH, Woo SJ, Lim YS, Kim OJ. The effects of animal-assisted activity on self-expression and school adaptation for multicultural children. J Animal Assisted Psychotherapy. 2019;8:67-81. https://doi.org/10.16896/kaaap.2019.8.1.67

A48. Lee HS, Kang WG, Kim HJ, An JW, Oh DR, Lee SY, Yang GH, Choi YH, Han IS, Hwang YH, Kim OJ. The effects of using play animal assisted activities program on the self-expression and peer relationship for lower grade elementary school children. J Animal Assisted Psychotherapy. 2019;8:15-28. https://doi.org/10.16896/kaaap.2019.8.1.15

A49. Im EK, Kim OJ. The effects of animal assisted intervention on the self-esteem and sociality of

underachieving middle school students. Korean J Play Therapy. 2019;22:339-359. http://dx.doi.org/10.17641/KAPT.22.3.6

A50. Kang WG, Kim OJ. A effect of animal assisted therapy on sociability of autism spectrum disorder of children. The J Humanities and Social science. 2020;11:2753-2768. http://dx.doi.org/10.22143/HSS21.11.6.194

A51. Shim HM, Woo JY. The effects of animal assisted play therapy on anxiety in a child with harm avoidance: focused on the dynamics between a child and a therapy dog. J Emotional & Behavioral Disorders. 2020;36:353-378. http://dx.doi.org/10.33770/JEBD.36.2.17

A52. Lee MJ, Kim OJ. The effects of animal-assisted education on emotional stability and personality of elementary school students. Korean J Play Therapy. 2020;23:71-91. http://dx.doi.org/10.17641/KAPT.23.1.5

A53. Lee SJ, Kim OJ. Effects of group animal-assisted therapy program on cognitive function, depression, and quality of life in the elderly with dementia. The Korean J Arts Therapy. 2020;20:115-134. https://doi.org/10.18253/kart.2020.20.2.06

A54. Jung SM, Seo BB, Kim CH. A case study of animal-assisted therapy on the human relationships, language use, and behavioral interactions of a child with autism spectrum disorder. J Korean Health & Fundamental Med Sci. 2020;13:127-135. https://doi.org/10.37152/kmhs.2020.13.2.127

A55. Jo JH, Kang WG, Kim OJ. The effect of animal assisted therapy program on the emotional regulation and self-esteem of juvenile convicts. Korean Juvenile Protection Review. 2020;6:113-140.

A56. Jo HJ, Kang WG, Kim OJ. The effects of animal assisted therapy on self-esteem and social skills of youth with difficulty adjusting school. Korean J youth studies. 2020;27:47-71. http://dx.doi.org/10.21509/KJYS.2020.06.27.6.47

A57. Kang WG, Oh GY. A effect of animal-assisted therapy using theraplay on parenting stress and parenting efficacy of mothers with disabled children. J Special Education & Rehabilitation Science. 2021;60:393-412. http://dx.doi.org/10.23944/Jsers.2021.03.60.1.19

A59. Kim MS, Jang SY, Gwag NE, Jang YS, Kim OJ. The effects of the animal-assisted therapy program on interpersonal relation of the senior women. J Animal Assisted Psychotherapy. 2021;10:35-42. https://doi.org/10.16896/kaaap.2021.10.2.35

A60. Park HA, Kim YM. Effects of animal-mediated play program on happiness and creative personality of childhood. J Learner-Centered Curriculum and Instruction. 2021;8:789-799. https://doi.org/10.22251/jlcci.2021.21.8.789

A61. Oh GY, Kang WG. Effects of therapy dog care farming program on emotional intelligence of low-income children in rural areas. The Korean Society of Culture and Convergence. 2021;43:731-749. https://doi.org/10.33645/cnc.2021.07.43.7.731

A62. Lee SJ, Kim OJ. The effects of animal-assisted intervention on social skills and brain function index of

children with intellectual disabilities. Korean J Special Education. 2021;55:223-251. http://dx.doi.org/10.15861/kjse.2021.55.4.223

A63. Im EK. The effects of animal assisted intervention on self-esteem and anxiety of adolescents. Korean J youth studies. 2021;28:161-183. https://doi.org/10.21509/KJYS.2021.10.28.10.161

A64. Jang MY, Choi NA, Cho AA, Nam YJ, Kang WG. The effects of the animal-assisted therapy program on depression in an elderly couple with mild neurocognitive disorder. J Animal Assisted Psychotherapy. 2021;10:43-50. https://doi.org/10.16896/kaaap.2021.10.2.43

A65. Jeong YR, SON JH. Development and application of animal assisted education program with abandoned dogs and the impact on elementary school students' character. J Korean Practical Arts Education. 2021;34:61-83. http://dx.doi.org/10.24062/kpae.2021.34.1.61

A66. Chan ML, Kim YJ. The effects of animal assisted therapy program on emotional intelligence, sociality and subjective well-being of adolescents with intellectual disabilites. The J Humanities and Social science. 2021:12:985-1000. http://dx.doi.org/10.22143/HSS21.12.5.70

A67. Kang WG, Kim CE, Keum MH, Kim BK, Lee JW, Park MJ, Son JH, Jang YS, Kim OJ. Effects of animal assisted activities on university students' depression and stress. J Animal Assisted Psychotherapy. 2022;11:47-55. https://doi.org/10.16896/kaaap.2022.11.1.47

A68. Kang WG, Lee JC, Kim OJ. The effect of animal communion group activities on peer attachment and school life adaptation of senior elementary school children. The J Humanities and Social science. 2022;10:15-28. http://dx.doi.org/10.22143/HSS21.13.5.2