The use of animal-assisted practices as a nursing intervention: A systematic review

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Abstract

Objectives: The Nursing Interventions Classification is used for planning nursing care. Animal-assisted practices, an intervention within this classification, is a treatment method that is widely used around the world. However, its use is limited in Turkey. Animal-assisted practices, which are used to support various groups today, constitute an intervention option in addition to medical treatments, ensuring health protection and promotion. This systematic review aims to analyze the randomized controlled studies that used animal-assisted practices and to determine the effects of this procedure and the interventions made, thereby contributing to the literature.

Methods: The databases on this subject were analyzed without any limitations on the publication year, and a total of 1,985 studies were accessed. The search was made using the keywords “animal assisted therapy,” “animal assisted therapies,” “pet therapy,” “pet therapies,” and “nursing” in the CINAHL, Cochrane Central, Medline/Pubmed, Web of Science, and Science Direct; and the keywords “hayvan destekli uygulama,” “hayvan destekli terapi,” and “hemşirelik” in the electronic databases of the National Thesis Center of the Council of Higher Education and the ULAKBIM. Six randomized controlled studies that met the inclusion criteria were included in the study. These six studies were evaluated in terms of the characteristics of their samples, the animals used, the place of the practice, the measurement tools, and their results.

Results: All studies were conducted in the last six years. In the randomized controlled studies, the sample comprised 66.66% old people, 16.67% adults, and 16.67% adolescents. The studies were conducted in elderly care centers (33.33%), hospitals (33.33%), elderly day care center (16.67%), and healthcare centers and hospitals (16.67%); they used dogs (as live animal), robotic pets, and humanoid robots within the scope of the intervention programs. They used different measurement tools to evaluate the effectiveness of the intervention. Animal-assisted practices were found to reduce stress and the use of analgesics, positively affect vital signs, support other treatments for mental diseases, and increase self-esteem, social interaction, and quality of life.

Conclusion: The results of this study showed that animal-assisted practices were an effective nursing intervention. However, it was found that randomized controlled studies indicating the effectiveness of animal-assisted practices were limited, and that no studies have been conducted in Turkey on this subject. It is suggested that studies should be conducted which use animal-assisted treatment as a nursing intervention, the results of which would further contribute to the literature. It is recommended that animal-assisted practices should be included more in nursing studies.

Keywords: Animal-assisted practice; nursing intervention; systematic review.

The primary aim of nursing is to protect and promote individuals’ health, and to provide them with care. Nursing care evaluates individuals in the biopsychosocial aspect and includes standardized care. Nursing diagnosis systems are used for planning nursing care. One such system is the Nursing Interventions Classification (NIC), which standardizes and...
What is known on this subject?

- Animal-assisted practices (AAPs) are known to positively affect individuals’ physical, mental and social healing. Animal-assisted practices are defined as “animal-assisted therapy” in the Nursing Interventions Classification (NIC).

What is the contribution of this paper?

- The results of this systematic review indicate that the use of AAPs by nurses is limited, but AAP is an effective and applicable intervention option in nursing care and practices, according to the low number of randomized controlled studies.

What is its contribution to the practice?

- This review summarizes the findings on the individuals or patient groups with whom AAPs can be implemented, the procedures implemented for the practice, and the study results. Based on these findings, the AAPs are considered to guide our colleagues during nursing care and raise awareness particularly on the use of AAPs in psychiatric nurses’ practices.

classifies the interventions that nurses can use. [1–3] NIC defines AAPs as “animal-assisted therapy.” [4–6] The use of AAPs is common around the world, but limited in Turkey.

AAPs enable the protection and promotion of individuals’ health through the benefits of human-animal interaction. Practices related to the benefits of human-animal interaction have been used for a long time. The first studies indicating the use of animals in treatment were conducted in 1792 in York Retreat, England, where farm animals were used to improve the behaviors of patients with mental disorders. [7,8] In the 1800s, Florence Nightingale, one of the leaders in nursing, stated the importance of animals in the care and treatment provided to individuals as follows: “a small pet is a perfect friend for patients especially in the treatment of chronic diseases.” [9–11]

AAPs are used in various areas, based on their intended use in the protection and promotion of individuals’ health. AAPs are frequently used in the treatment of behavioral disorders in children with low academic success or low self-esteem, who experience problems in adapting to school, and whose social relationships are poor or not developed. [12] In addition, AAPs can be used in various institutions, such as prisons, detention homes, or psychiatric hospitals [13] for individuals with mild or moderate autism within the scope of the care and treatment of psychiatric disorders; [14] to decrease or prevent the symptoms of depression, anxiety, or stress; [15] and to enable individuals to adapt to the physical and cognitive changes in the problems observed in childhood, adolescence, and old age. [16] AAPs are also used in addition to medical interventions for the treatment, care, and rehabilitation of arterial hypertension, cardiopathy, [13] chronic muscular and nervous system diseases, and different motor disorders, [14] since they strengthen the immune system, [17] decrease the disease symptoms, and accelerate healing.

AAPs involve programs designed to support and improve individuals in physical, emotional, and social aspects. Live, plush, or robotic animals (PARO-robotic pets, NAO-humanoid robots) can be used in AAPs. [18,19] These practices are carried out by various healthcare professionals, such as physicians, nurses, or psychologists. [20] Nurses can carry out the AAP programs in institutions such as nursing homes, hospitals, etc., or at home through home visits [20,21]—as a member of a team [22–24] or alone, [4,6] as an independent intervention.

The duties, authority, and responsibilities of psychiatric nurses are stipulated as “to continuously and systematically collect data using the therapeutic communication techniques and evidence-based assessment tools within a biopsychosocial integrity and implement the planned care process to protect and promote individuals’ mental health” in the Regulation on the Amendment of the Nursing Regulation, which took effect on April 19, 2011, in Turkey. [25] The NIC includes interventions such as supporting individuals’ interaction with animals and creating a safe environment for interaction, and it indicates activities regarding the practices within the scope of AAP. [4,6]

In this regard, AAP is an applicable intervention method within the scope of psychiatric nurses’ practices. The use of AAPs in nursing care is limited in the literature, and no studies have been found to use AAPs as a nursing practice in Turkey. This systematic review was conducted on the randomized controlled studies (RCS) that used AAPs as a nursing intervention, and the results of these studies are presented as a whole. Discussion of the study results is considered to be effective in making the use of AAPs as an intervention in nursing care and practices widespread.

Materials and Method

Aim: This systematic review aims to analyze the RCSs that used AAPs and to determine the effects of the procedures of AAPs and the interventions made, thereby contributing to the literature.

Scope of the Study: This review includes the RCSs conducted within the scope of nursing intervention as appropriate to the subject. The studies that were conducted on the AAPs but were not randomized controlled studies, were not conducted within the nursing intervention, and did not include a nurse among the researchers were excluded.

Study Questions:

This research focuses on the following questions:

- On which groups were the AAPs studied?
- How were the procedures and duration of the AAP structured?
- Which animal was used in the AAP?
- In which institutions were the AAP studied?
- Which assessment tools were used to assess the study results?
- What are the study results?

This study was reported in line with the PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) guide used in systematic reviews and meta-analyses. [26] Ethics committee approval was not required, as the study data would be obtained from published studies in the literature.
**Literature Review**

The electronic databases of CINAHL, Cochrane Central, Medline/Pubmed, Web of Science, Science Direct, National Thesis Center of the Council of Higher Education, and ULAKBIM were used in this systematic review. The search was made between February 1 and 14, 2019, in both Turkish and English, without making any limitations on the year of publication. The keywords used during the search were formed in the PICOS (P: Population, I: Interventions, C: Comparisons, O: Outcomes, S: Study designs) using the MESH terms (Table 1). The repeated studies (duplicates) were determined using the EndNote x7 program. After the studies’ titles and abstracts were screened by the researchers independently, the results of the screenings by each researcher were assessed, and six studies were included in this systematic review (Fig. 1).

**Inclusion and Exclusion Criteria**

The inclusion criteria for this systematic review were identified based on the PICOS (P: Population, I: Interventions, C: Comparisons, O: Outcomes, S: Study designs) format.

**Inclusion Criteria**

- **Participants**: Individuals for whom animal-assisted practices were carried out
- **Interventions**: Animal-assisted practice programs
- **Comparison group**: Those for whom animal-assisted practice intervention was carried out and those for whom it was not carried out
- **Outcomes**: Studies on the animal-assisted practices in which nurses worked were included.
  - The study results indicated that the AAPs reduce individuals’ stress levels and use of analgesics, regulate their vital signs, reduce depressive moods and agitated behaviors, increase individuals’ self-esteem, social interaction, and quality of life, as well as children’s school attendance rate, and serve as an additional support to the other treatments for mental disorders, such as depression and anxiety.
- **Study design**: The randomized controlled nursing studies appropriate to the subject were included.

**Exclusion Criteria**

- **Participants**: –
- **Interventions**: Those without any intervention program
- **Comparison group**: Those without any comparison group

**Selection of the Studies**

The MESH terms were identified, and the titles, abstracts and keywords related to the MESH terms were searched. The articles accessed in the databases included in the present study were transferred to the EndNote x7 program. The duplicated studies were excluded, and the articles’ titles and abstracts were analyzed. Figure 1 shows the PRISMA flow chart of the characteristics of the studies included in this review.

**Assessment of the Risk of Bias**

The risk of bias of the studies included in the systematic review was assessed based on the Cochrane Risk of Bias Assessment criteria. Based on those criteria, the studies’ risk of bias was assessed at three levels: low (+), unclear (?), and high (-) (Higgins et al., 2011) (Table 2). Based on the randomization methods employed by the studies, the risk of bias was assessed to be low in four studies and unclear in two studies; high risk of bias was not found in any studies. Hiding the randomization information was assessed to be a low risk of bias in four studies, an unclear risk of bias in one study, and a high risk of bias in one study. The risk of bias in terms of blinding the participants and personnel was assessed to be low in two studies and unclear in four studies, while high risk of bias was assessed to be low in four studies and unclear in two studies; high risk of bias was not found in any studies. Blinding of the result assessment and bias of loss were assessed to be a low risk in all studies. Bias of reporting was assessed to be a low risk in five studies and an unclear risk in one study. In terms of other types of bias, the risk of bias was assessed to be low in two studies, unclear in two studies, and high in two studies (Table 2). The risk of bias of the studies included in this review was assessed by all researchers independently and categorized by consensus.

**Data Analysis**

In this review, the findings of the studies, including the study type, methodology, participants, data analysis method, inter-
vention programs, and intervention results, were categorized and presented in a table. The findings section presents detailed data regarding the studies included in this review based on the inclusion criteria.

**Ethical Considerations**
The literature review does not pose any risk of causing a material or nonmaterial damage to the researchers. The studies analyzed in this review are shown in the references.

**Results**
The findings of this study are presented under six subtitles: study characteristics, practice method, the animal used, the place of the practice, the measurement tools used to assess the results of the practice, and the results of the studies (Table 3).

**Findings on the Characteristics of the Included Studies**
In this systematic review, 1,985 studies were accessed through a literature review. After the use of the EndNote x7 program and the manual check, 456 duplicate studies were excluded, and 1,529 studies were left. Upon reviewing the titles and abstracts, 551 studies were excluded from this review, as their subjects were not appropriate for this review. The full text of the remaining 978 studies was analyzed. Of these, the following were excluded: 166 full-text documents could not be ac-
processed, 68 were in different languages, 540 were conducted as reviews, 119 were descriptive in design, 39 were systematic reviews, 13 were meta-analyses, and 27 were conducted by researchers from other professions. The remaining six RCSs were included in the present systematic review. The results of these six studies are categorized in Table 3. The studies were conducted in 2014 and later in the United States of America (2), Italy (2), France (1), and Norway (1). The studies carried out the practices in nursing homes, day care centers and hospitals, using live and robotic animals during the intervention programs. They used different measurement tools to evaluate the effectiveness of the intervention.

Characteristics of the Practice Groups

The studies used the AAPs for individuals diagnosed with dementia, those with a mental disorder, elderly people, children and adolescents, and post-op patients with a hip or knee prosthesis through total joint replacement surgical operation. The studies were conducted with individuals who were presented to a psychiatric hospital due to a cognitive impairment or acute mental disorders and post-op patients. The samples of the studies were assessed based on age and developmental period found to consist of adults, elderly, and children and adolescents.

Findings on the Practice Method and the Animals Used

Five of the studies made comparisons with a control group for whom no interventions were made, and only one study used live animals, NAO and PARO were used together in the intervention and control group. The studies used live animals (dog) or the PARO, a Food and Drug Administration (FDA)-approved biofeedback tool, during the intervention. All of the studies were structured with different procedures based on their aims and sample groups. One of the studies compared the effectiveness of the intervention with another study conducted by Kaplan and Ludwig-Beymer (2004), which used AAPs. In the study by Kaplan and Ludwig-Beymer (2004), the patients were visited with dogs and were allowed to interact with the animal within the scope of the AAP intervention. Havey et al. (2014) compared the outcomes of the patients for whom the AAP was or was not carried out, finding that the rate of using analgesics and anesthetic painkillers was reduced among the patients after the AAPs.

In the studies, the AAP interventions were carried out using different procedures based on the characteristics of the sample and the aim of the intervention. Living or robotic (PARO) animals were used in these interventions, and a planned and purposeful AAP was carried out. The interventions were carried out continuously or at intervals; the intervention duration ranged from three to six months, two to three sessions were held during the intervention, and the duration of each session ranged between 20 to 60 minutes (Table 2).
<table>
<thead>
<tr>
<th>Article</th>
<th>Study type</th>
<th>Sample characteristics</th>
<th>Place of practice</th>
<th>Animal used</th>
<th>Measurement tools used</th>
<th>Content of the practice</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Havey et al., 2014</td>
<td>Retrospective randomized controlled study</td>
<td>Control Group: Patients receiving treatment in a hospital without an AAP program (n=46) Intervention Group: Patients receiving treatment in a hospital with an AAP program (n=46)</td>
<td>Two hospitals where AAP is and is not carried out</td>
<td>Live animal (dog)</td>
<td>Morphine Equivalent Daily Dose Conversion (MEDD) values</td>
<td>*The study compared the results of the study by Kaplan/Ludwig-Beymer (2004), who made an AAP intervention 10 years ago, and the painkiller amounts used by individuals in another hospital which did not carry out AAPs in the same period. In the study by Kaplan and Ludwig-Beymer (2004), the patients were visited with live animals (dogs) and were allowed to interact with the animal within the scope of the AAP intervention. *Havey et al. (2014) assessed the use of painkillers by the patients on the post-op second day using a retrospective patient chart and compared them with the rate of using painkillers by the patients in the control group. *The painkillers administered to the patients in both groups were compared upon being converted to their intravenous morphine equivalents using the conversion rates in the current literature. (morphine equivalent daily dose conversion: MEDD)</td>
<td>*The rate of using painkillers significantly reduced in the intervention groups, and then considerably decreased in the following days. *Patients who attended three or more AAP visits needed to use painkillers less. *The patient group who attended more AAP visits tended to receive lower doses of MEDD.</td>
</tr>
<tr>
<td>Stefanini et al., 2015</td>
<td>Randomized controlled study</td>
<td>Intervention group: adolescents with acute mental disorders (n=17) Control Group: Adolescents who continued to receive routine care and did not receive any AAP program (n=17)</td>
<td>Child and adolescent psychiatric hospital</td>
<td>Live animal (dog)</td>
<td>Children’s Global Assessment Scale (CGAS)</td>
<td>*A 16-session AAP program was carried out with the intervention group for one hour twice a week, for a total of six months, using four live animals (dogs).</td>
<td>It is reported that the AAP *increased the self-esteem. *developed social interaction, *increased the rate of school attendance and quality of life, and *increased the willingness to meet the daily needs and reduced the need of receiving care in the intervention group.</td>
</tr>
<tr>
<td>Valenti Soler et al., 2015</td>
<td>Randomized controlled study</td>
<td>Conducted with dementia patients NAO (n=33 in the first stage, n=0 in the second stage) PARO (n=33 in the first stage, n=42 in the second stage) live dog (n=0 in the first stage, n=36 in the second stage) control group (n=38 in the first stage, n=42 in the second stage)</td>
<td>Nursing home</td>
<td>NAO Pet robot (PARO) and live animal (dog)</td>
<td>Global Deterioration Scale (GDS) Neuropsychiatric Inventory (NPI) Severe Mini-Mental State Examination (3MMSE) Mini-Mental State Examination (MMSE) Dementia Nursing Home version (APADEM-NH) Apathy Inventory (AI) Apathy Scale for Institutionalized Patients Quality of Life Scale (QUALID)</td>
<td>*The interventions were carried out for the intervention group in two 3-month periods; and the total study duration was 15 months. *The interventions were carried out through 30- to 40-minute sessions twice a week for three months. *The effectiveness of the animal-assisted practices carried out with NAOs, PAROs and live animals (dog) was compared with each other and with control groups.</td>
<td>It is reported that the AAP *reduced agitation and *improved apathy and quality of life in the intervention group.</td>
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### Table 3. Characteristics of the analyzed studies (continue)

<table>
<thead>
<tr>
<th>Article</th>
<th>Study type</th>
<th>Sample characteristics</th>
<th>Place of practice</th>
<th>Animal used</th>
<th>Measurement tools used</th>
<th>Content of the practice</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olsen et al., 2016</td>
<td>Randomized controlled</td>
<td>Intervention Group: Elderly people for whom AAP was carried out (n=28)</td>
<td>Elderly day care centers</td>
<td>Live animal</td>
<td>Berg Balance Scale</td>
<td>*This multi-center study was conducted in 10 care centers with live animals (dogs). *The AAP has significant positive effects on balance. *The AAP is indicated to be a multifactor intervention in providing care to individuals with dementia. *It may have positive clinic effects reducing the risk of fall of individuals with dementia. *The AAP is highlighted to positively affect the level of depression and quality of life.</td>
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</tr>
<tr>
<td>Sollami et al., 2017</td>
<td>Randomized controlled</td>
<td>Intervention Group: Elderly individuals in nursing home for whom AAP program was carried out (n=14)</td>
<td>Nursing home</td>
<td>Live animal</td>
<td>Global Deterioration Scale (GDS) Hamilton Anxiety Rating Scale (HAM-A) Apathy Evaluation Scale (AES) UCLA Loneliness Scale Quality of Life Scale (QUALID)</td>
<td>*The AAP intervention was carried out for the intervention group in 45- to 60-minute individual and group sessions for three months using a live animal (dog). *It is reported that the AAP: *supported the treatment of the symptoms such as stress, depression, anxiety, and apathy, *increased oxygen saturation, *reduced the need for using analgesic and psychoactive drugs, and *increased social interactions in the intervention group.</td>
<td>*It is reported that the AAP: *supported the treatment of the symptoms such as stress, depression, anxiety, and apathy, *increased oxygen saturation, *reduced the need for using analgesic and psychoactive drugs, and *increased social interactions in the intervention group.</td>
</tr>
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</table>
Findings on the Place of the Practice

The studies were conducted in healthcare centers and hospitals, day care centers, and a child and adolescent psychiatric hospital. The AAPs were used for different age groups, and the elderly, scales assessing symptoms such as perception or memory in elderly patients were used. In addition to the scales for the assessment of the existence of mental disorders, such as anxiety and depression, scales assessing individuals' symptoms such as dementia and apathy, loneliness, and quality of life perception were used.

Findings on the Measurement Tools Used to Assess the Effectiveness of the AAP

The studies used different measurement tools to assess whether the AAPs cause physiological, neurological or psychosocial changes according to the study subject and the measured parameters. In the studies, in addition to the scales used to determine the individuals' need for analgesic and anesthetic-type painkillers and to assess the physiological symptoms such as their vital signs and stress or anxiety levels, scales for the assessment of individuals' balance and risk of fall were used. It was found that the measurement tools used to assess neurological findings differed by the sample groups' developmental periods, and in the studies included in this review, in addition to the scales rating the severity of the disease in children and the elderly, scales assessing symptoms such as perception or memory in elderly patients were used. In addition to the scales for the assessment of the existence of mental disorders such as anxiety and depression, scales assessing individuals' symptoms such as dementia and apathy, loneliness, and quality of life perception were used.

Findings on the Results of the AAPs

The study results indicated that the AAPs reduce individuals' stress levels and use of analgesics, regulate their vital signs, reduce depressive moods and agitated behaviors, increase individuals' self-esteem, social interaction, and quality of life as well as children's school attendance rate and serve as an additional support to the other treatments for mental disorders, such as depression and anxiety.

Discussion

This systematic review analyzed six randomized, controlled studies which used AAPs as nursing interventions to contribute to the literature on this subject. The results of the studies included in this review indicated that the AAPs contribute to individuals' physical and mental healing although their study groups, methods, and durations were different. The studies used AAPs for the individuals diagnosed with dementia or mental disorder and for elderly people, children, and adolescents, as well as for the post-op patients who received a hip or knee prosthesis through total joint replacement surgery. The AAPs were used for different age groups and patient groups. Particularly, the results of the studies conducted with individuals with mental disorders are remarkable in the literature. AAPs are observed to be used for individuals with mental disorders such as schizophrenia, individuals showing aggressive behaviors, individuals with mild or moderate autism within the scope of the treatment and care of psychiatric disorders, individuals with substance use disorder, and children who experience trauma. In addition, some studies indicate that AAPs are also used for post-op patients and patients who underwent organ transplantation. The AAPs were used for different age groups. They were used for children with behavioral disorders, low academic success, low self-esteem, who experience problems adapting to school, and whose social relationships are poor or not developed. Some studies show that AAPs are also used for elderly individuals. Analysis of the study groups of the studies included in this review, in which AAPs were carried out by nurses, showed that AAPs were used for all age groups, from children to the elderly with dementia and mental problems, or who have difficulty in communication. The results of these studies suggest that AAPs can be used in nursing care and practices for various age and diagnosis groups.

It was found that the AAPs were carried out by nurses through different procedures depending on the characteristics of the sample and the aim of the intervention. In the studies included in this review, the duration of the intervention ranged between three and six months; two to three sessions were held within the scope of the AAPs, and the duration of each session ranged from 20 to 60 minutes. In the literature, the duration of the AAP sessions mostly lasted for 20 to 30 minutes with the minimum duration being 10 minutes and the maximum duration being two hours, and the total duration of the intervention being four weeks minimum and 12 months maximum. In the studies, it was ensured that individuals were engaged in purposeful and planned activities by interacting with animals within the scope of AAP. The variety of the practice methods and procedures may be attributed to the study samples with different characteristics, different study aims, and the different animals used in the study.

The studies in which AAPs were carried out used live, plush, or robotic animals. In the present review, almost all nurses used live animals in the AAPs and preferred dogs as the live animal. One study used the PARO, an FDA-approved biofeedback tool, and one study used a live animal, NAO, and PARO together. In the literature, it is reported that various live, plush, and robotic animals, such as cats, rabbits, elephants, fish, dolphins, guinea pigs, and robins were used in the AAPs. The literature also shows that in addition to live animals, NAOs and PAROs were used in the AAPs. The reasons for robotic animals being preferred in the AAPs instead of live animals include the following: people are afraid of live animals; humans may develop allergic reactions to the animals and vice versa; the animals may become agitated; and caring for live animals is both costly and difficult. In addition, the ability of robotic animals to interact with humans through their sensors, respond to stimulants such as sounds and movements,
and repeat the commands given to them, and the fact that they do not have any known adverse effects, may facilitate their use in AAP interventions. Selection of the appropriate animal based on the characteristics of the group for whom the AAP will be used may be important for the effectiveness of the intervention; thus, it is important to select the animals carefully.

It was found that nurses carried out the AAP in different institutions and organizations, such as healthcare centers and hospitals, nursing homes, day care centers, and child and adolescent psychiatric hospitals. In the literature, AAPs have been carried out by researchers from other professions in schools, prisons, detention homes, disabled care and rehabilitation centers, and animal-assisted therapy centers. In addition to the institutions indicated above. Studies conducted by nurses were mostly carried out for the individuals who directly received medical treatment in healthcare institutions. It is considered important that the use of the AAPs by nurses in the care of vulnerable individuals in various institutions such as detention homes be made widespread and supported with study results.

It is seen that different measurement tools were used based on the characteristics and qualifications of the study assessing the effectiveness of the AAPs. The studies included in this review used scales that assess mental symptoms such as quality of life, depression, anxiety, and loneliness, as well as those that assess physical symptoms, such as pain level. The literature includes studies that assess both qualitative and quantitative data to assess the results of AAPs. In the quantitative studies, the Stress Symptoms Inventory, the Quality of Life Assessment Scale, and the Depression, Anxiety, Trait Anxiety, and Pain scales were used as appropriate to the study content. In addition, some studies also performed objective test methods, such as cortisol levels in saliva and EEG status. In addition, Silva and Osorio (2018) used the “Animal-assisted Therapy Assessment Questionnaire” to assess the effect of this practice in their study. The fact that the various measurement tools used in the studies include different parameters may be attributed to the fact that the AAP was effective in alleviating or eliminating both physical and mental symptoms.

The results of the nursing studies that used AAPs indicate that the practice was effective in the elimination or reduction of many physical and psychological symptoms. The studies included in this review indicated that the AAPs reduce individuals’ stress levels and use of analgesics regulate their vital signs, reduce depressive moods and agitated behaviors, increase individuals’ self-esteem, social interaction, and quality of life, as well as children’s school attendance rate, and serve as an additional support to the other treatments for mental disorders, such as depression and anxiety. The literature highlights that AAPs have many psychological, emotional, social and physical results which are beneficial. Studies indicate that the presence of animals facilitated individuals’ expression of their emotions and improved their communication, self-care, and self-confidence. The use of AAPs is widespread in the management of the symptoms of mental disorders. Studies have shown that AAPs reduce aggressive behaviors, anxiety, and stress levels, facilitate coping with the sense of loneliness and improve the perception of health, and have positive effects for individuals with attachment issues. The AAPs have also been observed to affect physiological symptoms. The study results in the literature indicate that individuals’ immune systems were strengthened, the cardiovascular system was regulated, their need for painkillers were reduced after surgery, and their motivation for treatment increased when AAPs were carried out for them. There are also studies which show the effectiveness of AAPs on children, as well as various age groups. The AAPs were found to increase the willingness of children, who had problems in school attendance, to attend the school, as well as increasing their adaptation to physical and cognitive changes in the problems observed due to developmental periods. The results of all studies indicate that the AAPs are effective and applicable as a nursing intervention.

Limitations of This Systematic Review
A limitation of this systematic review was that only the studies in seven databases were searched. This review was also limited to six studies included in the sample. The methodological differences, such as the forms and scales, sample size and the participants, and the type and interpretation of the relevant variables constitute an important limitation.

Conclusion
The results of this systematic review indicated that AAPs, which are indicated as a nursing intervention in the NIC, are carried out with different patient groups within the scope of different procedures and constitute a very effective intervention method. Nurses can carry out the AAPs as a member of the team or as a completely independent nursing intervention. The use of AAPs is current but limited around the world. In Turkey, although descriptive studies have recently been carried out on the applicability of AAPs in nursing studies, no randomized controlled studies have been found yet. The AAPs can be carried out with different animals, in different periods of time, and based on different procedures, depending on the sample. The literature shows that the AAPs have many benefits and can be carried out by nurses too. In this regard, it can be concluded that the AAP is an effective method. It is considered important that nurses, who have important roles and responsibilities in the care and treatment of different groups, such as the elderly, disabled, children, or adults, use AAPs actively in nursing care. It is recommended that nurses be informed about the procedures of AAPs, training be provided on the practice, the effectiveness of the AAPs be supported for dif-
different patient groups with RCSs, and the use of the AAPs be made widespread in nursing care and practice.

Conflict of interest: There are no relevant conflicts of interest to disclose.

Peer-review: Externally peer-reviewed.


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