



Effect of Animal Assisted Interventions on Inmates: A Systematic Review

*Hayvan Destekli Uygulamaların Tutuklu Bireyler Üzerine Etkisi:Sistemik Bir
Gözden Geçirme*

© Zehra Su Topbaş¹, © Nuray Şimşek¹

¹Erciyes University, Kayseri, Turkey

ABSTRACT

This study aims to examine animal-assisted interventions used in penitentiary institutions and to examine the effects of these interventions on prisoners. In the literature review conducted within the scope of the study, the words “animal assisted, pet assisted, dog assisted, horse assisted, interventions, therapy, inmate, prisoner” were used in combination. Seven studies that met the inclusion criteria were examined. One of the studies in this study was conducted according to the experimental design of the quantitative research method, one according to the quasi-experimental design of the quantitative research method, one to the mixed method, and four to the qualitative research method. As a result of the review of the seven articles discussed within the scope of the study, it was seen that the animal-assisted interventions used in penitentiary institutions positively had affected the psychosocial health of prisoners, helped prisoners gain new skills in self-awareness, coping with negative thoughts and coping with stress, self-expression, anger and negative emotion management, and self-care skills and maladaptive prisoner behaviors such as self-harm and aggression. It was also found that the prisoners were satisfied with these practices. These results have led to the conclusion that animal-assisted interventions may be beneficial in penitentiary institutions.

Keywords: Animal assisted therapy, pet-assisted therapy, prisoners, prisons

ÖZ

Bu çalışma ceza infaz kurumlarında kullanılan hayvan destekli uygulamaları incelemek ve mahkumlar üzerine olan etkisini ele almak amacıyla yapılmıştır. Çalışma kapsamında yapılan literatür taramasında, “hayvan destekli (animal assisted, pet assisted, dog assisted, horse assisted), uygulama (activities, interventions therapy), mahkum (inmate, prisoner)” kelimeleri kombine edilerek kullanılmıştır. Dahil edilme ölçütüne uygun yedi çalışma incelenmiştir. Çalışma kapsamına alınan makalelerden biri nicel araştırma yönteminin deneysel desenine, biri nicel araştırma yönteminin yarı deneysel desenine, biri karma yöntem, dördü ise nitel araştırma yöntemine göre yapılmıştır. Çalışma kapsamında ele alınan yedi makalenin incelenmesi sonucunda ceza infaz kurumlarında kullanılan hayvan destekli uygulamaların mahkumların psikososyal sağlığını olumlu etkilediği, mahkumlara öz farkındalık, olumsuz düşünceler ve stresle başa çıkma, kendini ifade etme, öfke ve olumsuz duyguları yönetme ve öz bakım becerileri konularında yeni beceriler kazandırmada yardımcı olduğu ve kendine zarar verme ve saldırganlık gibi uyumsuz mahkum davranışlarını azalttığı görülmüştür. Aynı zamanda mahkumların uygulamalardan memnuniyet duyduğu ortaya konulmuştur. Bu sonuçlar, ceza infaz kurumlarında hayvan destekli müdahalelerin yararlı olabileceği kanaatini oluşturmuştur.

Anahtar sözcükler: Hayvan destekli terapi, evcil hayvan destekli terapi, mahkumlar, hapishaneler

Introduction

Even though the history of interaction between humans and animals dates back to old times, this form of interaction has changed throughout the ages and has been reshaped according to the needs of the age. The domestication of animals, especially with the transition to agricultural production, precipitate the

human-animal interaction and strengthened the bond between humans and animals (Savishinsky 1983). After the Renaissance, it became prevalent to live with pets (Plemons 2008). In the later period, with urbanization, the rate of sharing habitats with dogs, cats, bird species and aquarium creatures increased, and pets began to be considered as a part of the family (Çetin 2017).

Address for Correspondence: Zehra Su Topbaş, Erciyes University Faculty of Health Sciences, Department of Mental Health and Diseases Nursing, Kayseri, Turkey

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ORCID ID: 0000-0001-7211-9850

When we consider the present time, it is seen that the relationships we establish with pets, which have become an integral part of our lives, reveal data about our personality structure and psychosocial health and can create opportunities for the protection and development of our health. A number of studies in the literature put emphasis on the fact that healthy relationships with animals have a positive effect on physiological and psychosocial health (Boldt and Dellman-Jenkins 1992, Endenburg and Van Lith 2011, Purewal et al. 2017). Upon the discovery of the positive effects of animal-human communication on health, animal assisted interventions began to be used in the field of medicine and its effectiveness has been supported by several literature studies (Kamiokaa et al. 2014, Charry-Sánchez 2018,).

Animal assisted interventions (AAI) can be defined by different names in the literature such as pet therapy, pet psychotherapy, animal assisted therapy. AAI, in general, can be described as the participation of animals in physical or psychological practices as part of the therapy process (Özkul 2014). By this therapy method, it is aimed to positively affect and improve psychological and physiological health by making use of human-animal interaction. Animal-assisted interventions are goal-oriented, planned and structured therapeutic approaches that can be applied by healthcare professionals, education professionals and other professionals serving human beings (IAHAIO 2013).

AAI can be used in different age groups and for different health problems in order to protect, improve and regain both physiological and psychosocial health. AAI, which can be used in children with problems such as behavioral disorders, socialization and communication problems, autism (McDanielPeters 2017, Pérez-Gómez 2020) can be practiced in elderly people with disorders such as dementia and motor dysfunction (Klimova et al. 2019, White-Lewis 2019). These methods, which are proven to be effective especially in psychiatric diagnoses such as post-traumatic stress disorder, depression, and anxiety disorders (Nurenberg et al. 2015), are known to have promising results in physiological disorders such as cardiomyopathies, hypertension, chronic muscular-nervous system diseases and cancer (Cole et al. 2007, McCullough et al. 2017). Prisons and reformatory facilities are one of the other important usage areas benefiting from AAI.

The detainees and convicts who are seen to represent a large population in our country and in the world (TUIK 2018), may face a number of problems both during their stay in prisons and after they are discharged (WHO 2019). In penitentiary institutions, factors such as poor physical conditions, lack of support for physical and psychological health, behavior patterns of the staff towards prisoners, aggression and violence among prisoners make incarcerated people a risk group in terms of physical and psychosocial health (WHO 2014, Quinn et al. 2019). Detainees and convicts who may be vulnerable in terms of mental disorders such as depression, anxiety disorders, post-traumatic stress disorder and substance abuse in particular may need psychosocial support (Torrey et al. 2010). It seems extremely important for inmates to be able to integrate into the society in a healthy way after they are released, both in terms of achieving the purpose of

the prison sentence and in terms of preventing repetitive crimes (Strimple 2003). Difficulty in adapting to society, unemployment, physical and mental illnesses, and the tendency to commit crimes again after being released make this issue a public health problem (WHO 2019). Prisoners' acquiring new skills, learning to regulate their maladaptive behaviors, and receiving employment-oriented training in penal institutions stand out as important factors affecting the public health as well as the individual health of prisoners in regard to facilitating their adaptation to society (WHO 2019). AAI, one of the practices that can be used for the purpose of supporting prisoners' psychosocial health, helping them acquire new skills, reducing their maladaptive behavior and expanding employment opportunities (Strimple 2003), is considered worthy of research as a set of methods that are not widely used in penitentiary institutions but are thought to have benefit potential. Within the scope of this systematic review, an answer was sought to the question "Does AAI applied on prisoners have an effect on supporting the psychosocial health of prisoners, giving them new skills and reducing their maladaptive behaviors?"

Method

This systematic review has been made to evaluate the studies carried out in the last ten years that show the effectiveness of AAI applied to detainees. Within the scope of this study, a literature review was carried out between November 01, 2020 and November 30, 2020, and the databases used were Pubmed, Science Direct, Ulakbim Medicine Database, Wiley Online Library, Web of Science, APA PsycNET and AcademicSearch Ultimate. In the searches, the study was performed by making various combinations with the keywords. Keywords used in the searches are given in Table 1.

The criteria for including studies reached after the literature review were determined as studies examining AAI applied to prisoners in penal institutions or forensic psychiatry units, studies with experimental and quasi-experimental research design, available in online full text, qualitative or quantitative, conducted in Turkey or around the world, written in English or Turkish, and published between 2010 and 2020. The exclusion criteria were determined as all studies involving interventions on prisoners other than AAI, all studies in which AAI was applied to groups other than prisoners, descriptive studies, case reports, panel presentations, oral and poster presentations, reviews, and dissertations.

As a result of the literature review conducted within the scope of the study, a total of 744 articles from 7 databases were reached. In these studies, the relevant titles and abstracts were reviewed independently by two researchers, and studies suitable for the purpose of this systematic review were designated (19). Among

Table 1. Key words used in searches

Animal assisted, pet assisted, dog assisted, horse assisted
Activities, therapy
Inmate, prisoner

these studies, the same ones were identified and eliminated (12). Among the remaining studies, seven full-text articles that met the inclusion criteria were identified (Figure 1).

Within the scope of the study, a coding form developed in line with the purpose of the research was used. The coding form was established according to the variables of the year of study, country of study, participants (number, age, gender), place of study (prison, high security psychiatric hospital), study design, AAI properties (the animal used, method of application, duration of application). All articles were reviewed and coded independently by both authors, and the coder reliability formula proposed by Miles and Huberman (1994) was used to look for compatibility between the coders (Miles and Huberman 1994). After applying Opinion agreement = Consensus / (Disagreement + Consensus) X 100 formula, it was observed that the coder reliability was sufficient (> 80%).

Results

Sample Characteristics

When the studies covered in the systematic review are analyzed according to the sample characteristics, it is seen that the participants consist of both prisoners staying in prisons (Jasperson 2013, Mercer et al. 2015, Minke 2015, Mims et al. 2017, Edwards et al. 2019) and individuals staying in high-security forensic psychiatric hospitals (Holman et al. 2019, Dell et al. 2019). Considering the number of the samples of the studies, it has been seen that Jasperson (2013) worked with the highest sample number of 74 people and Dell et al. (2019) worked with the lowest sample number of three people. Considering the

sample inclusion and exclusion characteristics, it has been seen that inpatient psychiatric patients were excluded (Jasperson 2013) while it is observed that in two studies, individuals with a diagnosis of psychiatric disorder were included in the study (Holman et al. 2019, Dell et al. 2019) in two studies, individuals with a history of substance abuse were included in the study (Holman et al. 2019, Edwards et al. 2019) in one study, prisoners with a particularly high tendency to violence were included in the study (Dell et al.2019) and in another study, those with a serious sexual crime history were excluded from the study (Jasperson 2013). In some studies, it has drawn attention that criteria such as interest in group work (Holman et al. 2019), strong participatory aspect (Mercer et al. 2015), no dog allergy and no history of violence against animals (Holman et al. 2019) were adopted in order to facilitate compliance with the AAI program.

Program Implemented

In the studies reviewed, it has been seen that dogs were used as therapy animals for AAI (Jasperson 2013, Mims et al. 2017, Minke 2017, Holman et al. 2019, Dell et al. 2019). In the first of the two remaining studies, horses were used within the scope of AAI (Edwards et al. 2019), while in the second (Mercer et al. 2015) farm animals (chicken, goat, duck, and pony) were used (Table 2). In studies, it has been seen that the therapeutic effect of animals is used as part of different applications. In one of the studies analyzed, the practice was applied to measure the effectiveness of AAI against cognitive behavioral therapy (CBT) and psychoeducation program (Holman et al. 2019), while in another, it was aimed to measure the effectiveness of having dogs in the training with the same content given to prisoners divided into two groups (Jasperson 2013). In a study in which prisoners with maladaptive behaviors were selected

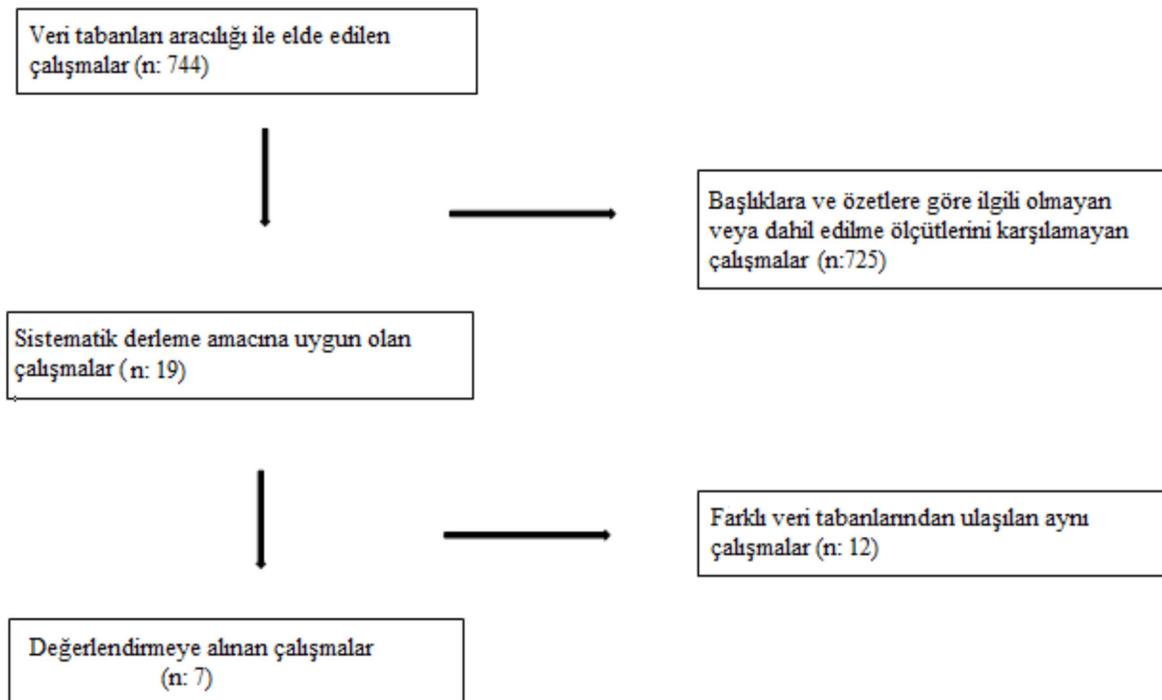


Figure 1. Evaluation flow chart of the studies included in the systematic review

(Dell et al. 2019), training was given to meet the needs of the prisoners, accompanied by a therapy dog. Again, in two studies (Mims et al. 2017, Edwards et al. 2019) included in this review, it has been observed that prisoners were provided with information about and participation in animal care. In two other studies reviewed (Mercer et al. 2015, Minke 2017), it was aimed to examine how this situation affects prisoners when animals are part of the prison environment and when prisoners have a chance to interact with them. For this purpose, animals were held as a part of the environmental conditions of the prison and no special treatment was applied to the prisoners.

Data Collection Methods

In the articles included in the study, it was seen that both quantitative and qualitative methods were used in the data collection process and the data was mostly based on the self-report of individuals. Again, it was seen that in some studies pre-test – post-test evaluation was made while in some studies evaluation was made after each session and semi-structured interview forms were used during the implementation process. In the study conducted by Jaspersen (2013) with the pre-test - post-test method, a 45-item self-report scale named The Outcome Questionnaire-45.2 was used. With this scale, participants' interpersonal relationships, symptom levels, social role-performances and general distresses were measured. In the study conducted by Holman et al. (2019), pre-test – post-test were applied to the participants. Within the scope of the study, Patient Health Questionnaire-9, Generalized Anxiety Disorder-7 and PTSD Checklist, which were validated and reliable in Turkish, were used to collect the data of the participants. In the study conducted by Dell et al. (2019), the data of the prisoners were collected by both quantitative and qualitative methods. At the end of each session applied within the scope of the study, questionnaires consisting of 4 or 5 questions, including quantitative and qualitative questions, were applied to inmates, clinicians and trainers conducting the study. In addition, semi-structured interviews with prisoners, staff and clinicians (45 minutes each on average) were conducted in the middle of the program (i.e. after the 12th session) and at the end of the program, and interview data were recorded. In the study conducted by Edwards et al. (2019), 60-minute semi-structured interviews were conducted with prisoners after the therapies.

Each of these interviews, which consisted of open-ended questions, was audio-recorded and transcribed. Within the scope of the study conducted by Mims et al. (2017), participants were asked to fill out questionnaires consisting of open-ended questions based on self-report, and the data were written down and common themes were evaluated. In the study conducted by Mercer et al. (2015), semi-structured interviews were made with all participants. Finally, it is seen that the methodology of Minke's (2017) study is based on qualitative methods including observation, participation observation and interviews. All interviews with the participants within the scope of the study were recorded both as audio recordings and in written form.

Results of the Studies

Prisoners' Thoughts on AAI

In the studies that collected data with the qualitative method, the opinions of the prisoners about AAI were taken and it was stated that the prisoners expressed their opinion that these practices had created feelings such as love and acceptance. Within the scope of the study conducted by Dell et al. (2019), the opinions of the prisoners participating in the program regarding AAI were taken and analyzed. Looking at the common themes in the evaluations of the participating prisoners, it was seen that communicating with a dog created a feeling of "love, support and relaxation" for them. All the participants stated that meeting the therapy dog made them happy, and when asked why, they mainly responded with the answers of "feeling love", "establishing a bond", "feeling happy" and "unconditional acceptance". In the study conducted by Edwards et al. (2019), it was emphasized that the positive emotions expressed by the participants at the end of the program about the bonds they established with the therapy horses drew attention as a common theme. In the study conducted by Mims et al. (2017), it was emphasized that the participants were satisfied for receiving training in dog care, and attention was drawn to the opinions of the prisoners that their employment potential increased. The study conducted by Minke (2017) mentioned the positive views of prisoners about having a dog they can communicate with in prison conditions. The prisoners stated that the presence of a dog in the prison made them feel as if they were "outside" and emphasized that this situation reduced the need for their own pets in prison conditions.

Effects of the Interventions on Mental Health

In all the articles reviewed in this study, it is stated that AAI reduces the stress level of prisoners. Again, other remarkable effects of these interventions are that they reduce anxiety and depression levels, and increase feelings of trust and support. It was stated that according to the data of the self-evaluation questionnaire used in the study by Jaspersen (2013), which also includes questions about the psychiatric condition of the person, there was no difference between the experimental and control groups, but it was noted that according to the pre-test and post-test results there was an improvement in both treatment groups. In the study conducted by Holman et al. (2019), it was emphasized that there was a decrease in subjective anxiety, depression and post-traumatic stress disorder (PTSD) symptoms in both cognitive behavioral therapy and AAI groups, and it was revealed that both interventions were equally effective. In the study conducted by Edwards et al. (2019) with criminals with a history of addiction, it was emphasized that after horse therapy, the stress and anxiety levels of the prisoners had shown a decrease. In the same study, it was stated that the horse therapy applied had increased the self-awareness levels of the prisoners and contributed to their emotional regulation, and at the same time it was revealed that it had contributed to

Table 2. Findings of the studies included in the systematic review				
Source	Type of Study	Participants	Method	Method Of Measurement
Jasperson (2013)	The experimental design of the quantitative research method was used.	<ul style="list-style-type: none"> - The study was conducted with female inmates at the Utah State Penitentiary, USA, between February 2009 and May 2010. - Of the participants, 36 were included in the experimental group and 38 in the control group (divided into small groups of 9-11 people) - Participants were randomly assigned to groups 	<ul style="list-style-type: none"> - All groups were given an 8-hour session per week. - Training was planned and delivered to each group Educational content; Developing boundaries, trust, confidence, responsibility, awareness, healthy self-expression, and new behaviors - The only difference between the two groups given the same training was that there was a dog in the experimental group during the sessions and the participants were able to interact with the dog. 	<ul style="list-style-type: none"> -The Outcome Questionnaire-45.2 The scale is a self-report scale consisting of 45 items.
Mercer et al. (2015)	- It is a qualitative type of research.	<ul style="list-style-type: none"> - The study was conducted with 3 prisoners and 5 staff in a category B prison in England. 	<ul style="list-style-type: none"> - There was an animal center within the prison territory, which could be visited by those who wanted to, and which contained chickens, goats, ducks and miniature ponies. There were additionally 2 dogs in the group in which the study was conducted. The dogs were free to roam anywhere, including offices, cells, the common room area, and were cared for by the inmates and the staff together. 	<ul style="list-style-type: none"> - Semi-structured interviews were conducted. - All interviews were transcribed word by word and analyzed using thematic analysis (TA) technique.
Mims et al. (2017)	<ul style="list-style-type: none"> - It is a qualitative type of research. - Semi-experimental design with no control group 	<ul style="list-style-type: none"> - The study was conducted in a prison in Florida / USA. - The participant group consisted of 9 people including male and female inmates. 	<ul style="list-style-type: none"> - This program, which is implemented as the Pawsand Stripes College Program, aims to provide inmates with information about dog care and training, and to spend time with them and gain new skills. The program also allowed participants to receive training in pet emergency response and receive a certificate. 	<ul style="list-style-type: none"> - In the program using qualitative data analysis, participants were asked to fill out questionnaires consisting of open-ended questions based on self-report.
Minke (2017)	- It is a qualitative type of research.	<ul style="list-style-type: none"> - The study covers the period from November 2014 to March 2015 in an open-condition prison in Denmark. - 3 female staff and 12 female inmates working in the prison were interviewed and data was collected. 	<ul style="list-style-type: none"> - A female employee brought her own dog to the prison workshop, which was established in 2014 to ensure normalization in prisons, and the inmates had the opportunity to interact with the dog every weekday. 	<ul style="list-style-type: none"> - The research methodology is based on qualitative methods, including observation, participation observation and interviews. - All interviews with inmates were audio-recorded and also transcribed.
Dell et al. (2018)	<ul style="list-style-type: none"> - It is a mixed method study. - Research data was collected by using qualitative and quantitative methods together. 	<ul style="list-style-type: none"> - The study was conducted in a Canadian high-security psychiatric hospital with three inmates, two men and one woman, from September 1, 2015 to April 30, 2016. 	<ul style="list-style-type: none"> - A female employee brought her own dog to the prison workshop, which was established in 2014 to ensure normalization in prisons, and the inmates had the opportunity to interact with the dog every weekday. - The intervention consists of a total of 24 sessions. - The practice team consists of a therapy dog and trainer, as well as a mental health clinician. Within the scope of the study, the trainings that the prisoners need individually were determined and given to the prisoners. After the training, the behavior desired to be developed in the prisoner was reinforced by experimental learning with the therapy dog. 	<ul style="list-style-type: none"> - Following each 24-hour session, mental health clinicians had the inmates complete questionnaires consisting of four or five qualitative questions and four or five quantitative questions. - Qualitative data was evaluated by experts, while quantitative data was analyzed using SPSS version 23.

Table 2 (continued.) Findings of the studies included in the systematic review				
Author-Year	Type of Study	Participants	Method	Method Of Measurement
Edwards et al.	- It is a qualitative type of research.	- The study was conducted with male inmates in a category D (open conditional) prison in England. - Participants comprised of prisoners with a history of alcohol/drug addiction. - Having been planned originally with 8 participants, the study was carried out with 5 participants.	- AAI was administered to the prisoners with two horses. Each session of the therapy, which was planned to consist of ten sessions in total, consisted - AAI was administered to the prisoners with two horses. Each session of the therapy, which was planned to consist of ten sessions in total, consisted of 90-120 minutes. - The prisoners were able to care for the horses and communicate with them under the guidance of a therapist.	- Inmates were asked open-ended questions after the program and their views on therapy were collected. - Each interview (conducted by the second author) lasted approximately 60 minutes. These were audio recorded and transcribed, and a copy of the transcript was sent to each participant. - The phenomenological analysis method was used to evaluate the prisoners' personal experiences in detail.
Holman et al. (2020)	- The quasi-experimental design of the quantitative research method was used.	- The study was conducted with 19 female prisoners in a forensic psychiatric hospital in USA. - Participants were distributed to two different groups on a voluntary basis.	- CBT was applied to the control group of the prisoners divided into two different groups, and AAT (animal assisted therapy) was applied to the experimental group. - AAT was accompanied by a dog and its caregiver. - Before the application, both groups were pre-tested and 8 sessions of therapy were applied to each group.	- With Turkish validity and reliability; 1. Patient Health Questionnaire-9 2. Generalized Anxiety Disorder-7 (GAD-7) 3. PTSD Checklist

the development of a sense of achievement in the prisoners and thus supported their self-esteem. In the study conducted by Mims et al. (2017), the therapeutic effect of the program was mentioned and the potential for improvement in the symptoms of stress, anxiety and depression developed in prisoners due to staying in prison was pointed out. In the study conducted by Merker et al. (2015), it was pointed out that communicating with animals contributes to the rebuilding of the sense of trust in prisoners, which had been damaged due to their past experiences. In the same study, prisoners stated that spending time with a dog had reduced their stress levels and they felt happier. In Minke's (2017) study, attention was drawn to the prisoners' views that communicating with a dog gave them emotional support.

Effect of Practices on Interpersonal Relations and Social Role Performance

Considering the results of the articles included in the study in terms of interpersonal relations and social role performance, it is reported that the dog used in the practice had an intermediary role in communicating with others and that the prisoners talked to each other or with the staff about the dog. In the randomized controlled study conducted by Jaspersen (2013), it was stated that while there was an improvement in social role performance in all of the experimental and control groups, there was no significant difference between the groups after the program. Considering the outcome of the AAI program, which was planned and implemented according to the needs of the participants, by

Dell et al. (2019), it was noted that there were positive changes in the prisoner with social isolation problem according to the qualitative data analysis, and it was stated that the prisoner was able to communicate with another participant in the program about the dog. Finally, according to the data analysis conducted in Minke's (2017) study, it was stated that when they were not dogs the prisoners were bored and did not communicate, and the dog served as a catalyst for communication in the workshop environment.

Animal-Assisted Interventions and Personal Skills

Personal skills include self-awareness, coping with negative thoughts and stress, self-expression, managing anger and negative emotions, respecting themselves and others, and self-care skills. In the study conducted by Dell et al. (2019), it was stated that the bond established with the dog contributes to the development of self-awareness in prisoners. The study of Edwards et al. (2019) has drawn attention to the potential of inmates' taking care of horses and establishing a bond with them, to contribute their skills of coping with problematic thoughts, self-expression and anger management. The study also emphasized that there was an increase in prisoners' belief that they could change negative things and their self-esteem. In the study conducted by Mims et al. (2017), it was stated that the employment potential of the prisoners participating in the dog care training program had shown an increase. In the study, it was also mentioned that the program implemented could contribute to the skills of the prisoners such as self-confidence, self-expression, respect

for others and sense of responsibility. In the study conducted by Merker et al. (2015), it was emphasized that the sense of responsibility created by looking after a dog was clearly noticed in the interviews with the prisoners. It was also stated by the prison staff that while the prisoners did not take responsibility for their personal care before, there was a significant change in their self-care skills after they started to care for dogs.

Effect of Interventions on Maladaptive Behaviors Seen in Prisoners

Studies show that reductions in maladaptive behaviors are reported by the statements of prison staff. Prison staff reported a decrease in prisoners' self-harming behavior. The study conducted by Dell et al. (2019) mentions the decrease in maladaptive behaviors of prisoners participating in the study and showing maladaptive behaviors. It was stated that when the therapy dog was reminded by the prison staff to the prisoner who attempted to self-harm, she/he stopped this maladaptive behavior, and in a prisoner with aggressive tendencies, this behavior abated. Within the scope of the study carried out by Merker et al. (2015), opinions of prison staff were taken about the behavior of prisoners. Prison staff reported that "calmer and less stressful" behaviors were observed in prisoners who were responsible for dog care. In the study, the biggest change reported by the personnel was stated to be the decrease observed in the self-harming behavior of criminals.

Discussion

In this study, the effect of AAI, which is used in penitentiary institutions and forensic psychiatry units, on prisoners was analyzed. For this purpose, the studies included in the review were reviewed under the titles of the prisoners' views on the intervention, the effects of the interventions on their mental health, the effects on the personal skills of the prisoners and the effects on negative behaviors. In all the articles included in the study, the positive opinions and satisfaction of the prisoners attract attention regarding the AAI applied in general. It is seen that while expressing their satisfaction, the prisoners talked about the feeling of being loved by animals, the fun of spending time with animals (Dell et al 2019), and the sense of mutual trust established with animals (Mercer et al. 2019). In particular, in the animal-assisted workshop conducted by Minke (2017) within the scope of the "normalization" process in the prison, it was found remarkable that the prisoners expressed that they felt like they were "at home". Considering the conditions in penitentiary institutions (UNODC 2017), this result seems worthy of attention in terms of the psychosocial health of the prisoners. The "normalization" process in prisons, which has been adopted and implemented in various ways, especially by the Scandinavian Countries, aims to support the rehabilitative feature of penitentiary institutions by adapting them to the normal conditions outside as much as possible (Reiter et al. 2018). The success of this method in rehabilitating prisoners is, of course, the subject of another study. However, the satisfaction of being able to have a bond with pets by inmates supports the idea that pets can be used as a therapeutic tool in prisons.

Considering the results of the articles reviewed within the scope of the study, the findings related to psychosocial health were found to be remarkable. In the studies, it was stated that the practices contributed to the reduction in stress, anxiety levels and depression symptoms (Mims et al. 2017, Holman et al. 2019, Edwards et al. 2019). These results are in line with the existing literature studies that communicating with pets is beneficial in reducing anxiety (Shiloh et al. 2003, Barker et al. 2003) and stress (Kertes et al. 2017, Williams et al. 2018) levels and contributes to improvement in depression symptoms (Thodberg et al. 2015, Ambrosi et al. 2019). In the studies evaluated, it was observed that the interpersonal relations and social role performances of the prisoners were also improved as a result of AAI (Merker et al. 2015, Minke 2017, Dell et al. 2019). In the light of these findings, it is thought that AAI can be beneficial in terms of protecting the health of the detainees, which we can define as a risk group in terms of psychosocial problems, and to support the treatment of existing psychiatric diseases.

In view of the skills that AAI provides to the prisoners, it is seen that it contributes to the inmates in increasing self-awareness (Dell et al. 2019), self-expression skills and anger management (Edwards et al. 2019). In the study conducted by Edwards et al., the prisoners were given training on horse care and they were provided with skills in this regard. In the study conducted by Mims et al. (2017), it was emphasized that inmates' participation in a certified dog training program increased their employment potential. It seems extremely important for the prisoners who rejoin social life after being released to acquire new skills in order for the convicts to adapt to the society, to be employed and to prevent the repetition of the crime. There are various workshops for convicts in Turkey for this purpose (Engin 2012). It is assumed that while prisoners can gain skills in caring for animals such as horses and farm animals, certified training programs can also be useful in matters such as cat and dog care, considering the rates of pet ownership and changing needs today.

Within the scope of the study, the results were finally reviewed in terms of the effect of AAI on maladaptive behaviors observed in prisoners. In the studies discussed, opinions were taken from prison staff on this issue and it was stated that there was a decrease in self-harming and aggression behaviors (Merker et al. 2015, Dell et al. 2019). When the studies on this subject are analyzed, the study of Nurenberg et al. (2015) stands out, which includes horse and dog assisted therapy practices with psychiatric patients having aggressive behavior characteristics. As a result of the study, it was emphasized that AAI is an effective method in preventing violence and it can be used. In the systematic review by Jones et al. (2019), seven studies including AAI applied to adolescents were analyzed and it was stated that the interventions were helpful in decreasing the maladaptive behaviors of adolescents.

Conclusion

Studies included in this systematic review are limited to searches made with combinations of the terms animal-assisted, pet

assisted, dog assisted, horse assisted; practice, activities, therapy; and inmate, prisoner, in Pubmed, Science Direct, Ulakbim Medical Database, Wiley Online Library, Web of Science, APA PsycNET and AcademicSearch Ultimate databases.

Within the scope of the study, studies including AAI conducted in penitentiary institutions were analyzed. The findings gained from the studies discussed show that animal-assisted therapies can be beneficial in protecting the psychosocial health of inmates in prisons and supporting the treatment of psychiatric problems, helping improve prison conditions, providing inmates with new skills and reducing maladaptive behaviors that can be seen in prisoners. It is thought that AAI has a great potential in terms of increasing the rehabilitative features of penitentiary institutions and facilitating the adaptation of inmates to prisons. However, it is noteworthy that almost all of the studies on this subject in the literature are qualitative studies. It is deemed that there is a need for quantitative studies with larger samples in order to understand the effectiveness of AAI applied in prison conditions and to reveal its existing potential.

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References

- Ambrosi C, Zaiantz C, Peragine G, Sarchi S, Bona F (2018) Randomized controlled study on the effectiveness of animal-assisted therapy on depression, anxiety, and illness perception in institutionalized elderly. *Psychogeriatrics*,19:55-64.
- Barker SB, Pandurangi AK, Best AM (2003) Effects of animal-assisted therapy on patients' anxiety, fear, and depression before ECT. *J ECT*, 19:38-44.
- Boldt MA, Dellmann-Jenkins M (1992) The impact of companion animals in later life and considerations for practice. *J Appl Gerontol*, 11:228-239.
- Charry-Sánchez JD, Pradilla I, Talero-Gutiérrez C (2018) Animal-assisted therapy in adults: A systematic review. *Complement Ther Clin Pract*, 32:169-180.
- Cole KM, Gawlinski A, Steers N, Kotlerman J (2007) Animal-assisted therapy in patients hospitalized with heart failure. *Am J Crit Care*,16:575-585.
- Çetin E (2017) Tüketim toplumunda evcil hayvanların sahiplenilmesi: Sosyolojik bir analiz. *Sosyoloji Araştırmaları Dergisi*, 20:89-107.
- Dell C, Chalmers D, Stobbe M, Rohr B, Husband A (2019) Animal-assisted therapy in a Canadian psychiatric prison. *Int J Prison Health*, 15:209-231.
- Endenburg N, Van Lith HA (2011) The influence of animals on the development of children. *Vet J*, 190: 208-214.
- Engin M (2012) Suçu önleyici tedbirler bağlamında ceza infaz kurumlarında çalışma ve eski hükümlü istihdamı. *Çalışma İlişkileri Dergisi*, 3:24-35.
- Holman LF, Ellmo F, Wilkerson S, Johnson R (2020) Quasi-experimental single-subject design: Comparing seeking safety and canine-assisted therapy interventions among mentally ill female inmates. *J Addict Offender Couns*, 41:35-51.
- IAHAIO (2014) The IAHAIO Definitions for Animal Assisted Intervention and Animal Assisted Activity and Guidelines for Wellness of Animals Involved. Seattle, WA, IAHAIO.
- Jasperson RA (2013) An animal-assisted therapy intervention with female inmates. *Anthrozoos*, 26:135-145.
- Jones MG, Rice SM, Cotton SM (2019) Incorporating animal-assisted therapy in mental health treatments for adolescents: A systematic review of canine assisted psychotherapy. *PLoS One*, 14:e0210761.
- Kamiokaa H, Okada S, Tsutani K, Park H, Okuizumi H, Handa S et al. (2014) Effectiveness of animal-assisted therapy: A systematic review of randomized controlled trials. *Complement Ther Med*, 22:371-390.
- Kertes DA, Liu J, Hall NJ, Hadad NA, Wynne CDL, Bhatt SS (2016) Effect of pet dogs on children's perceived stress and cortisol stress response. *Soc Dev*, 26:382-401.
- Klimova B, Toman J, Kuca K (2019) Effectiveness of the dog therapy for patients with dementia - A systematic review. *BMC Psychiatry*, 19:276.
- McCullough A, Ruehrdanz A, Jenkins MA, Gilmer MJ, Olson J, Pawar A et al. (2017) Measuring the effects of an animal assisted intervention for pediatric oncology patients and their parents: A multisite randomized controlled trial. *J Pediatr Oncol Nurs*, 35:159-177.
- McDanielPeters BC, Wood W (2017) Autism and equine-assisted interventions: A systematic mapping review. *J Autism Dev Disord*, 47:3220-3242.
- Mercer J, Gibson K, Clayton D (2015) The therapeutic potential of a prison-based animal programme in the UK. *Journal of Forensic Practice*, 17:43-54.
- Miles MB, Huberman AM (1994) *Qualitative Data Analysis: An Expanded Source Book*. 2nd ed. California, Sage.
- Mims D, Waddell R, Holton J (2017) Inmate Perceptions: The impact of a prison animal training program. *Sociology and Criminology-Open Access*, 5:175-178.
- Minke LK (2017) Normalization, social bonding, and emotional support—a dog's effect within a prison workshop for women. *Anthrozoos*, 30:387-395.
- Nurenberg JR, Schleifer SJ, Shaffer TM, Yellin M, Desai PJ, Amin R et al. (2015) Animal-assisted therapy with chronic psychiatric inpatients: Equine-assisted psychotherapy and aggressive behavior. *Psychiatr Serv*, 66: 80-86.
- Özkul T (2014) Türkiye'de hayvan destekli terapi uygulamalarından örnekler. IV. National Symposium of The History of Veterinary Medicine and Professional Ethics, 21-23 Mayıs 2014 Mersin, Türkiye. Kongre Özet Kitabı sayfa:36
- Pérez-Gómez J, Amigo-Gamero H, Collado-Mateo D, Barrios-Fernandez S, Muñoz-Bermejo L, Garcia-Gordillo MA et al. (2020) Equine-assisted activities and therapies in children with attention deficit hyperactivity disorder: A systematic review. *J Psychiatr Ment Health Nurs*, 42:104-113.
- Plemons AM (2008) *Commodifying Fido: Pets As Status Symbols* (Master thesis). Texas, Texas A&M University.
- Purewal R, Christley R, Kordas K, Joinson C, Meints K, Gee N et al. (2017) Companion animals and child/adolescent development: A systematic review of evidence. *Int J Environ Res Public Health*,14:234.
- Quinn S, Doyle S, Emerson C (2019) Female prisoners' problems living in an Irish prison: An exploratory study. *Occup Ther Ment Health*, 35:219-237.
- Reiter K, Sexton L, Sumner J (2018) Theoretical and empirical limits of Scandinavian exceptionalism: isolation and normalization in Danish prisons. *Punishm Soc*, 20:92-112.
- Robinson-Edwards S, Kewley S, Riley L, Fisher D (2019) Examining prisoner experience of an equine assisted psychotherapy. *Ther Communities*, 40:111-124.
- Savishinsky JS (1983) *Pet Ideas: the domestication of animals, Human Behavior and Human Emotions*. In *New Perspectives on Our Lives with Companion Animals* (Eds AH Katcher, AM Beck): 112-131. Pennsylvania, University of Pennsylvania.
- Shiloh S, Sorek G, Terkei J (2003) Reduction of state-anxiety by petting animals in a controlled laboratory experiment. *Anxiety Stress Coping*, 16:387-395.

Strimple EO (2003) A History of prison inmate-animal interaction programs. *Am Behav Sci*, 47: 70–78.

Thodberg K, Sørensen LU, Christensen JW, Poulsen PH, Houbak B, Damgaard V et al. (2015) Therapeutic effects of dog visits in nursing homes for the elderly. *Psychogeriatrics*, 16:289–297.

Toreld EM, Haugli KO, Svalastog AL (2018) Maintaining normality when serving a prison sentence in the digital society. *Croat Med J*, 59:335–339.

Torrey, EF, Kennard AD, Eslinger D, Lamb R, Pavle J (2010) More Mentally Ill Persons are in Jails and Prisons than Hospitals: A Survey of the States. Arlington; VA, Treatment Advocacy Center.

TÜİK (2019) Ceza İnfaz Kurumu İstatistikleri, 2018. Ankara, Türkiye İstatistik Kurumu.

United Nations Office On Drugs and Crime (2017) Addressing the Global Prison Crisis. Vienna, United Nations Office On Drugs and Crime.

White-Lewis S, Johnson R, Ye S, Russell C (2019) An equine-assisted therapy intervention to improve pain, range of motion, and quality of life in adults and older adults with arthritis: A randomized controlled trial. *Appl Nurs Res*, 49:5-12.

WHO (2014) Prisons and Health. Copenhagen, WHO Regional Office for Europe.

WHO (2019) Status Report on Prison Health in the WHO European Region. Copenhagen, WHO Regional Office for Europe.

Williams C, Emond K, Maynard K, Simpkins J, Stumbo A, Terhaar T (2018) An animal-assisted interventions influence on graduate students' stress and anxiety prior to an examination. *Open Access Library Journal*, 5:e4831.