

SZEW CZYK, Dorota, FIEGA, Jakub, MICHALSKA, Milena, ŻUREK, Urszula, LUBASZKA, Zuzanna and SIKORSKA, Ewa. Therapeutic Role of Animals: A Comprehensive Literature Review on the Prevalent Forms and Species in Animal-Assisted Interventions. Journal of Education, Health and Sport. 2023;45(1):215-235. eISSN 2391-8306.
<https://dx.doi.org/10.12775/JEHS.2023.45.01.015>
<https://apcz.umk.pl/JEHS/article/view/45312>
<https://zenodo.org/record/8274047>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of 17.07.2023 No. 32318. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical Culture Sciences (Field of Medical sciences and health sciences); Health Sciences (Field of Medical Sciences and Health Sciences). Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 17.07.2023 Lp. 32318. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przynależność dyscypliny naukowej: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu).
© The Authors 2023;
This article is published with open access at Licensee Open Journal Systems of Nicolaus Copernicus University in Torun, Poland
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike.
(<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 24.07.2023. Revised:21.08.2023. Accepted: 22.08.2023. Published: 24.08.2023.

Therapeutic Role of Animals: A Comprehensive Literature Review on the Prevalent Forms and Species in Animal-Assisted Interventions

1) Dorota Szewczyk

ORCID: 0009-0008-9269-2687

e-mail: dorota.szewczyk10@gmail.com

Międzyleski Szpital Specjalistyczny w Warszawie, ul. Bursztynowa 2, 04-749,
Warszawa, Poland

2) Jakub Fiega

ORCID: 0009-0007-9188-1382

e-mail: fiegakub@gmail.com

Wojewódzki Szpital Zespolony w Kielcach, ul. Grunwaldzka 45, 25-736 Kielce, Poland

3) Milena Michalska

ORCID: 0000-0002-8052-5661

e-mail: milena.michalska@interia.eu

Państwowy Instytut Medyczny MSWiA ul. Wołoska 137, 02-507, Warszawa, Poland

4) Urszula Żurek

ORCID: 0009-0008-3482-5381

e-mail: ula.zurek@gmail.com

Warszawski Szpital Południowy, ul. rtm. Witolda Pileckiego 99, 02-781 Warszawa,
Poland

5) Zuzanna Lubaszka

ORCID: 0009-0008-3034-1697

e-mail: zuzannalubaszka97@gmail.com

Wojewódzki Szpital Zespolony w Kielcach, ul. Grunwaldzka 45, 25-736 Kielce, Poland

6) Ewa Sikorska

ORCID: 0000-0003-2352-650X

e-mail: ewa.sikorska@wum.edu.pl

Katedra i Zakład Fizjologii Doświadczalnej i Klinicznej, Warszawski Uniwersytet

Medyczny, ul. Banacha 1B, 02-097 Warszawa, Poland

Abstract

Animals have been valued and used to improve human physical and mental health since ancient times. Animal-assisted therapy (AAT) is a complementary approach to traditional medicine, involving trained animals. AAT can enhance cognition, commitment, character growth, and the learning process. Commonly used species in animal-assisted therapy include cats, dogs, horses, dolphins, and others. Feline-assisted therapy alleviates loneliness and stress, whereas canine-assisted therapy positively impacts emotions and overall well-being. Equine-assisted interventions benefit individuals with cognitive and motor disabilities. Dolphin-assisted therapy shows promise for conditions like autism and cerebral palsy. However, ethical concerns have arisen, particularly in children with behavioral disorders. Safety measures, adult supervision, and proper screening and hygiene practices are crucial in AAT programs. In conclusion, AATs have a significant potential to enhance well-being and mental health across various contexts, but more research is needed to fully understand their effectiveness and safety in different settings and age groups. The existing literature consists of subjective accounts and inadequate methodologies.

Methods

A thorough review of the literature was done using the keywords: animal-assisted therapy, zootherapy, felinotherapy, human-animal bond, therapeutic animals, and any combination of those (as well as its Polish translations) in online databases such as Google Scholar, PubMed, and ResearchGate. The reference lists of original articles were used to identify additional publications.

Keywords: Animals; zootherapy; felinotherapy; therapeutic animals; animal-assisted therapy; the human-animal bond

Aim of the study

This study aims to define the many methods of animal-assisted therapy based on the usage of several animal species including cats, dogs, horses, dolphins, aquarium fish, birds, alpaca, and donkeys, and to highlight some general benefits that these animals can bring in therapy. Given the historical context and current findings, we will demonstrate the advantages of AAT and focus on safety and ethical concerns related to this topic.

Introduction

Currently, animal-assisted therapy (AAT) refers to the intentional interaction of trained animals and patients and serves as a complementary approach to conventional therapy methods [1]. It is used to enhance the physical and mental well-being of children as well as adults. Therapy incorporates a wide range of domesticated species, such as cats, horses, and dogs, along with more unusual animals, such as dolphins or tiny mammals like guinea pigs [2].

Animal-assisted therapy is experiencing growing support across different forms. Animals are used to enhance cognition, commitment, character growth, and learning development [2]. Therapies can occur in a variety of settings, including activities such as games, exercise, and animal nurturing. They are performed privately or in groups and are adapted to the individual requirements of each patient [1].

AAT has even made its way into prisons. The Washington State Pet Partnership Program teaches prisoners how to take care of dogs within prison gates, which are also used in rehabilitation centers to assist patients in regaining their stamina, coherence, and motion [3]. Nevertheless, current evidence suggests that interacting with an animal can develop tolerance, confidence, and relationships, and may help to make inmates' lives more casual, as many of them had a pet prior to their incarceration. An accessible study of different programs was positive. A recurring element in prison animal programs is that they assist offenders in rediscovering their sense of purpose in life [4].

Animal-Assisted Psychotherapy (AAP) is also used with a wide range of groups, including children and teens facing adversity, people with neurodevelopmental disorders, people receiving psychiatric care, ex-military personnel, and inmates, as mentioned before [5].

Although there are potential advantages, there are still concerns about whether the use of animals in the healing process is safe for both animals and humans.

History

History of the human-animal bond

Since ancient times, animals have been valued and employed to improve human physical and mental performance [2, 6, 7]. Archeological evidence reveals that the presence of animals has been inseparably linked to human life since 12,000 BCE [1, 8]. Domesticated wolves were common in ancient societies. These men and their dog progenitors had such a profound relationship that they were frequently buried with each other in one grave. People considered dogs as defenders and equal participants in hunting approximately five millennia later [9]. They have also been shown to be beneficial in rescue squads, illicit goods searches, special guards, security purposes, and therapy. Cats were domesticated by humans over 6,000 years ago, mostly to control rodents [8]. Animals play a crucial role in the overall picture of how people connect to the environment [10]. Although the utilization of animals for therapeutic purposes has a lengthy historical background, it was not until the twentieth century that its prevalence grew significantly [1].

The origins of animal-assisted therapy (AAT) and animal-assisted psychotherapy (AAP)

Dogs are currently one of the most commonly used animals in AAT [9]. The idea that maintaining relationships with animals could serve as training of social skills, especially for the younger, first appeared in 1699. At the time, John Locke suggested offering kids different small animals to care for to encourage them to develop empathy and a sense of accountability for others [11]. Since the early stages of psychotherapy, this informal practice of including animals in treatment has been noted, with Sigmund Freud using his pet chow, Jofi, in his therapy sessions. Jofi would paw at the door at the end of each session, and Freud would refer to Jofi's behavior and moods as mirrors of the client's inner processes. Additionally, Freud believed that animals, particularly dogs, have a unique capacity to analyze a person's character [5, 12]. In 1946, feline therapy was brought into the Therapeutic Section of Rio de Janeiro's National Center for Psychotherapy. Nise de Silveira initially managed to transport a cat inside the clinic where she was employed and used it to help her with the therapy [13].

During the turn of the 1960s and 1970s, pediatric psychologist Boris Levinson investigated the effects of animal-aided therapy on young people. A more relaxed atmosphere was created

by taking his own dog to the children's therapy appointments, resulting in the patient opening up and sharing more [9]. He is credited with the development of contemporary Animal-Assisted Psychotherapy (AAP). He initially shared his firsthand observations at the 1961 American Psychological Association conference, and subsequently through publications e.g. in 1965, 1984, and 1997 [5]. Corson and colleagues in 1977 conducted a crucial pilot study in which a walking-with-dog program's impact on adult and adolescent psychiatric inpatients was examined. The study found that the program led to a decrease in reaction time to the therapist's questions, a significant increase in the number of words used in responses, and an improvement in the rate of questions answered [11]. In 1998, a study by Barker and Dawson involving 241 patients diagnosed with anxiety and different psychiatric conditions aimed to investigate the effectiveness of animal-assisted therapy meetings in reducing anxiety levels among hospitalized psychiatric patients. The study yielded significant results, as it revealed that these sessions led to a notable reduction in anxiety for patients with affective and psychotic disorders [9].

Definitions

Animal-Assisted Therapy (AAT) and Animal-Assisted Activities (AAA) are not the same thing. Pet Partners formerly known as "Delta Society" is one of the leading groups in the United States in charge of organizing and delivering animal-aided programs. They approved some terms and definitions of animal involvement in the therapeutic setting [14]. The table below describes the main of them according to the Pet Partners' website as well as other research sources (Table 1).

Table 1. Selected terms and their definitions.

AAI (Animal-Assisted Intervention)	Planned programs focused on outcomes that actively use animals in medical care, schooling, and social work for therapeutic benefits and better health and overall well-being. AAI includes animal-assisted therapy (AAT), animal-assisted activities (AAA), and animal-assisted education (AAE). In any of these approaches, the animal might be a team member working under a professional's supervision or the professional's own animal [15].	
AAT (Animal-Assisted Therapy)	Animal-assisted therapy (AAT) is a professionally sanctioned therapeutic approach or program focused-on outcomes used by physicians, occupational therapists, physiotherapists, registered recreational therapy specialists, social workers, nurses, clinicians in speech therapy, and other psychological professionals [2, 9,15]. It is a more sophisticated type of intervention aimed at accomplishing particular therapeutic goals such as improving one's social, personal, physical, and cognitive performance. AAT is tailored to each patient's particular demands. Animals that fulfill specific requirements are used in the program. It may occur in various places, including medical centers, hospitals, rehabilitation facilities, care homes, jails, private households, and farms for animals. Each patient's development and attainment of initial objectives is carefully documented and evaluated since it must be accompanied by applicable paperwork. AAT is not based on any specific psychology theory and may be utilized in a variety of ways [1]. AAT contains AAP (Animal-Assisted Psychotherapy)	
	AAP (Animal-Assisted Psychotherapy)	A form of AAT in which animals are incorporated into the psychotherapeutic process.
AAA (Animal-Assisted Activities)	Animal-assisted activities (AAA) are motivating and instructive interactions between people and animals that attempt to improve patients' quality of life. These sessions can take place in a variety of locations and are led by professional therapists or a volunteer in collaboration with highly trained animals. Unlike traditional therapy programs, AAA allows patients and animals to interact spontaneously, without the necessity for tracking and assessing progress. There are no defined programs or goals to achieve in therapy. Through the formation of one-on-one connections with the animals involved, participants in AAA develop self-interest, connect with other residents, and engage with their surroundings [2, 16].	
AAE (Animal-Assisted Education)	Animal-assisted education (AAE) is a targeted and structured therapeutic intervention that uses animals to achieve educational goals. It is frequently employed for children with learning impairments. These activities, led by general or special education experts, focus on achieving educational objectives, promoting social skills, and improving cognitive function. Students' progress is meticulously assessed and documented [2,15].	

Some studies use the word zootherapy as a synonym for Animal-Assisted Therapy.

General benefits of AAT

The available research on this issue is still mostly anecdotal, statements of opinion, and weakly conducted studies. Despite these limitations, there is a widespread belief among healthcare professionals, academics, and the general public that animals, when used as social aids, provide various advantages to people [17].

For instance, Yabroff et al. in 2008 discovered an average link between owning a dog and significant amounts of physical activity in research that included 41,514 people that owned pets such as cats and dogs (or both of them at the same time) or non-domestic animals. Another study conducted by Herzog in 2011 found that keeping pets at home improves owners' health, psychological well-being, and lifespan [18].

Pets have the amazing capacity to provide everlasting devotion, stimulate motivation, and relieve social stress in their owners [8]. Interacting with animals may also promote human development, boost education, aid in rehabilitation, and improve the overall quality of life. Dogs, alpacas, horses, and others may be important companions in therapeutic settings. They may also be beneficial incentives for participating in new hobbies [2]. AAT works well because animals do not judge, and therefore do not exert pressure. Contact with them has a positive effect on the level of relaxation, and they also improve sensory integration in the case of physical contact [19].

According to research, being around animals helps reduce stress levels among people. Human-animal contact has been correlated with quantifiable decreases in heart rate and blood pressure [9]. Odendaal showed that the presence of dogs can reduce a person's cortisol level, resulting in decreased anxiety [5, 20].

Furthermore, studies demonstrate that pet owners have a lower likelihood of death within one year of experiencing a heart attack compared to non-pet owners (respectively 1% vs. 7%) [21]. In a survey conducted by Erica Friedmann, the impact of social isolation on mortality rates in individuals hospitalized for serious heart disease was investigated. The study primarily focused on the influence of human relationships, but among all the survey questions, pet ownership emerged as the most significant predictor of surviving one year after hospitalization. Statistics indicate that owning a pet correlates with a longer life expectancy, with pet owners appearing to have one-third of the death rate of patients without pets [10].

In the healthcare setting, patients often experience feelings of powerlessness, vulnerability, and dependence on others. However, the presence of animals can transform them into potential caretakers for another living being, assuming responsibility for activities related to the animal's well-being and survival [1]. Furthermore, studies have shown that elderly patients who own pets, particularly dogs, have a reduced number of physician visits compared to those without pets [22]. AAT offers incentives and opportunities for engaging in physical activities that enhance the patient's physical well-being while providing a sense of enjoyment and fun. Activities such as walking, running, athletics, and playing with animals contribute to the production of endorphins, leading to improved mood. Implementing AAT in patients diagnosed with some psychiatric conditions (autism, depression, schizophrenia, dementia) can lead to notable improvements in their personality and behavioral and physical health. These modifications primarily influence their social interactions and have positive effects on the intellectual, psychological, and affective aspects, improving skills that may have been inhibited because of the underlying disease [1].

Even though data on the efficacy of AAT is scarce, many therapists and patients have observed and attested to its advantages [9].

Commonly utilized species and their therapeutic significance

Cats

Feline-assisted therapy, also known as felinotherapy or cat-assisted therapy, is a relatively new field within animal therapy and has been introduced in Poland in 2004 [2, 13]. This form of therapy is most frequently implemented in long-term care institutions like hospices and assisted living facilities [13].

Its applications extend to various individuals, including those with mental and motor disabilities, individuals experiencing loneliness, and those with rheumatological conditions [13]. The therapeutic benefits of feline-assisted therapy are achieved through contact with the cat. These interactions have a positive impact on human well-being by alleviating loneliness, lowering stress, and facilitating social connection [23]. Physical contact with cats stimulates the production of endorphins, enhances the immune system, and promotes relaxation. Activities involved in feline therapy primarily revolve around brushing, playing, stroking, lifting, cuddling, and feeding the cat. Through these exercises, joint mobility improves, pain is reduced, functional ability is enhanced, and patients gain increased independence [13]. Cats for felinotherapy are chosen depending on their temperament and personality. The cat must be

open to human contact, such as being receptive to stroking, brushing, and snuggling. Prominent cat breeds utilized in felinotherapy include Ragdoll, Maine Coon, and Persian cats [24].

Dogs

Canine-assisted therapy, also known as dog-assisted therapy or kynotherapy, is widely recognized as the most prevalent form of animal-assisted therapy [25].

The Polish Society of Kynotherapy (PTK, Polskie Towarzystwo Kynoterapeutyczne) differentiates three therapeutic procedures that involve the assistance of dogs. The first of them is SP (an abbreviation for Polish Spotkanie z Psem - meeting with a dog) aimed at positive first spontaneous contact. Subsequently, there is EP (an abbreviation for Polish Edukacja z Psem - education with a dog), which requires a skilled professional to conduct classes. The dog motivates learning and, by creating a friendly emotional environment, increases the possibility of assimilating knowledge. Lastly, there is TP (an abbreviation for Polish Terapia z Psem - therapy with a dog) - a set of exercises aimed at a specific, planned goal. These interventions align closely with the divisions outlined by Pet Partners included in this review in Table 1. (SP as AAA, EP as AAE, TP as AAT). Meeting with a dog (SP) provides a variety of advantages for both impaired and non-disabled juveniles [2, 26].

Research on positive human-animal interaction has indicated that dogs exhibit similar physiological effects, such as a rise in prolactin, oxytocin, and beta-endorphin levels, mirroring those observed in patients [20]. Thus, the benefits of canine-assisted therapy extend to both animals and humans [10]. It has been found to have a positive impact on a person's emotions, health, and general quality of life, reducing symptoms of stress and depression [27].

As one of the studies showed, in the presence of dogs, several mothers have reported significant improvements in their children's behavior during medical visits. They expressed astonishment, stating that their children behaved exceptionally well with the dog, contrary to their typical reactions in similar situations. These mothers observed that their children were less apprehensive and exhibited increased engagement, demonstrating behavior that differed from their usual illness-related lethargy or withdrawal [28].

Documented research shows how dogs can help in reading programs in classrooms. The primary objective is to encourage children with reading difficulties to read aloud to the animal. The dog's capacity to provide unwavering acceptance aligns well with the needs of children

facing reading challenges. Examples of reading programs that have been implemented in the United States include the R.E.A.D. program (Reading Assistance Dogs) in Salt Lake City, Utah, and the program at the Lincoln Parish Library in Ruston, Louisiana [9]. Research findings have indicated significant improvements in reading levels among all participants involved in these programs. Additionally, a program "Reading with Rover" involving homeschooled children reported a 30% improvement in reading fluency and enhanced reading confidence. Their parents stated that their children voluntarily read aloud more often [9, 29]. Participating children in these types of programs experience tremendous progress in reading and communication abilities, leading to enhanced self-worth, confidence, and interpersonal skills. There are additional benefits observed, including improved performance in other disciplines such as attendance, and even positive effects on personal hygiene [30].

Kynotherapy, the therapeutic use of dogs, was officially recognized and included in the Register of Professions and Specializations in Poland in 2007 [31]. Dogs chosen for therapy purposes undergo a selection process based on their temperament and adaptability to various environments or situations. There are specific criteria that the dog must meet to be certified as a therapy dog, with good health and non-aggressive behavior being crucial factors [9]. To become qualified for therapeutic work, dogs are required to demonstrate particular training-related skills, including fundamental obedience commands, as assessed during the therapeutic dog examination [32].

Horses

In addition to canine-assisted therapy, equine-assisted interventions (horse-assisted interventions or hipotherapy) are one of the most prevalent forms of AAT [25]. According to the Canons of Polish Hipotherapy, hipotherapy is defined as a targeted therapeutic approach aimed at improving human mental, physical, intellectual, and/or interpersonal performance. It involves the use of a well-trained horse as a crucial component of the therapeutic process. Hipotherapy is administered by professional hipotherapists in line with referring doctors' recommendations and in consultation with other medical professionals engaged in the patient's care [33].

Equine-assisted interventions encompass four distinct types:

- horseback physiotherapy,
- psycho-pedagogical horse riding and vaulting,

- equine-assisted activities involving interaction with a horse,
- horseback riding for disabled individuals, which, although not strictly categorized as hipotherapy, is closely related and can be seen as its continuation.

These interventions typically serve individuals with cognitive and motor disability [2].

Hipotherapy can be also divided by some authors into two distinct types of therapy: one involving the child taking on the responsibility of properly taking care of a horse, and the other being therapeutic riding [9].

The initial phase of hipotherapy focuses on the patient learning or acquiring new skills related to horse care. Building a strong therapeutic relationship between the therapist and the child is a crucial element in facilitating skill development. Many children undergoing hipotherapy struggle with irritability, fear, and low self-esteem, thus necessitating the establishment of trust between the child and therapist. Fostering this trust involves being upfront and honest with the juveniles, showing them support and understanding, and reminding them that mastering new abilities takes time [34].

A variety of illnesses and ailments for which hipotherapy is advised are included in The Canons of Polish Hipotherapy (2020) and other works by different authors. These include social pathologies, addictions, cerebral palsy, postural issues, Down syndrome, psychiatric problems, post-stroke conditions, and craniocerebral trauma as well as autism, or learning and speech disabilities. The practice of therapeutic riding can improve balance, body position, flexibility, and reaction time, but also issues with emotions, cognition, and behavior [9, 35]. In a 2004 research, Macauley and Guterrez examined the effects of standard treatment versus animal-assisted therapy, especially hipotherapy, on male kids with learning difficulties. Compared to the group receiving conventional speech treatment, the parents of the group receiving hipotherapy reported higher speaking and learning abilities [36].

When selecting horses for hipotherapy, factors such as temperament, responsiveness, gait type (preferably soft), and anatomy are taken into consideration. It is advised that horses wait until they are five years old to begin working. Additionally, geldings are more commonly used in hipotherapy compared to mares [2].

Dolphins

Dolphin-assisted therapy combines aquatic therapy with animal-assisted therapy, specifically involving dolphins. However, it is important to note that this kind of therapy is not currently

available in Poland [2]. Although dolphins may initially elicit fear in some individuals, their playful nature, ease of human interaction, and smiley facial expressions can transform anxiety into sympathy [37]. According to Chuprikova and Dąbrowska (2016), dolphin-assisted therapy has shown utility in the treatment of conditions such as Down syndrome, autism, cerebral palsy, attention-deficit/hyperactivity disorder (ADHD), and Rett syndrome [2]. Although there is presently no scientific proof of this, it has been postulated that dolphin-emitted ultrasound could stimulate cell regeneration [38]. Children with intellectual impairments are the primary target population for this kind of AAT. Autism and Rett syndrome for instance are multidirectional developmental disorders that present challenges across various aspects of daily life and dolphin-assisted therapy and dog-assisted therapy are among the preferred AAT approaches for helping with these conditions [18]. A special trainer, a therapist (such as a physician, psychologist, or rehabilitator), and a highly trained dolphin make up the therapeutic team [2].

Fish

Since watching fish move may draw attention and improve concentration, a view of an aquarium with swimming fish is frequently utilized for visual stimulation. This activity can be particularly enjoyable for the elderly or individuals who may be feeling lonely [39]. Contact with aquarium fish has been found to have a positive and calming effect on patients in nursing facilities or hospitals, promoting relaxation [2].

In a study conducted by Edwards and Beck (2002) on Alzheimer's patients, the researchers assessed how the presence of aquarium fish in the patients' living environment influenced their appetite. The study included 60 Alzheimer's patients who were living at home. Over a period of six weeks, information on their eating habits was collected in an environment with an aquarium, as well as through weekly observations. The findings revealed a significant increase in food intake among the patients with Alzheimer's disease in the presence of an aquarium, which continued to increase during the six-week observation period. The patients also experienced weight gain during the study. The researchers concluded that aquarium fish enhanced the patient's surroundings, elevated their spirits, and stimulated their appetite. Furthermore, they noted that residents who had contact with aquarium fish required less nutritional support, resulting in reduced expenses for healthcare services [18, 39].

Birds

Due to their intelligence, capacity for learning, and for developing close relationships with people, parrots are the most frequently employed birds in animal-assisted interventions. Physical proximity and emotional stimulation can both be obtained by parrot interaction [40]. While canines are often emphasized as the preferred animal companions for palliative care settings, Tremayne argues that resident budgerigars in hospices can also provide social as well as health benefits. The author suggests that the bird may serve as a substitute for a pet that the patient had owned before being admitted to the hospital and also says that staff members may derive pleasure from the presence of the bird. However, it is important to note that there is currently no data available to support these claims [17].

In a study involving psychiatric patients, it was observed that a higher number of patients attended group meetings held in a room where a finch was present in a cage, as compared to a corresponding group in the area without birds. This suggests that the presence of a finch in the room may have had a positive influence on patient engagement and participation [18].

Alpacas

The use of alpacas in animal-assisted therapy is growing as a result of their attractiveness, gentle nature, and trainability [24]. Alpaca-assisted interventions can align with the standards set by organizations like Pet Partners, encompassing various forms such as meetings, education, or therapy (relatively AAA, AAE, and AAT) with alpacas. These interventions have shown effectiveness for individuals with both physical and intellectual disabilities, as well as for healthy ones. Still, alpaca-assisted therapy is rather uncommon in Poland, but meetings are the most prevalent type of this therapy [2].

Alpacas are not ridden during treatment sessions like horses and donkeys are. The focus of therapy with alpacas is on contact, feeding, and an appropriate amount of touch. Alpacas have a distinctive and attractive look that appeals to both children and adults, which makes it easier to engage the child's interest during treatment [41].

Alpaca-assisted therapy has demonstrated success in supporting the treatment of various problems such as anxiety-related conditions or depression. It has also shown positive effects in kids with autism, ADHD, Down syndrome, or cerebral palsy [24]. Additionally, it can be implemented in medical care facilities, where the presence of alpacas positively impacts the well-being of patients [41].

Alpacas must be carefully chosen and properly prepared to be used in treatment. Animals with mild temperaments are preferred, and males are chosen more frequently but they must be neutered. Basic skills, such as walking on a leash and being transported in a vehicle or livestock trailer, are expected. Desensitizing the animals to sensations of touch is also crucial, most importantly for their hind limbs [24].

Donkeys

Donkeys are utilized in a manner similar to horses, involving activities such as grooming, riding, and interaction with the animal. Donkey-assisted therapy, also known as onotherapy, has shown therapeutic effects comparable to those observed in hipotherapy. Both adults and kids with intellectual and motor difficulties benefit greatly from it [2].

Donkeys, as highlighted by Camillo et al. (2018), possess qualities that make them suitable for therapy. They are smaller and slower than horses and their longer, softer hair covering provides a pleasant tactile experience [42]. Individuals who are fearful of horses or dogs often prefer donkeys. Onotherapy can be used in adult mental health issue therapy as well as in the rehabilitation of children with limitations in mobility, mental illnesses, or autism [43]. Despite the common perception of donkeys as "stupid and stubborn," they are actually teachable animals. With the guidance of a skilled handler, donkeys demonstrate a willingness to cooperate and actively participate in therapy sessions [44].

Ethical concerns

It may make sense to use animal-assisted therapy to help kids with emotional or/and behavioral problems, but it also raises questions about possible dangers. It is unsettling to think of placing another living creature in the care of students with behavioral disorders since they display unpredictable actions. However, there is encouraging evidence and study in favor of using animals in a controlled and secure environment [9]. For instance, according to research by Palestrini et al. in 2017, the correct intensity of work of a dog through animal-assisted intervention poses no risk to animal well-being because neither physiological nor behavioral stress occurred in the animals. On the other hand, earlier in 2011, King et al. stated that dogs exhibited stress-related behaviors such as gasping, yawning, and whining right after AAT meetings [2].

It is essential to teach the child the right way to treat animals in order to promote safety and respectful relationships. Most child-animal encounters should also be watched over by an

adult, particularly during the first phases of the AAT program [8]. The welfare and safety of the animals have been taken into account since the beginning of this topic's research. For instance, in a study from 1995 kids engaged in AAT were divided into three teams of around five kids each and to protect the well-being of the animals involved, the sessions were spaced out into half-hour segments [10].

Only a few studies have examined the health effects of AAT on the used therapeutic canines, while most research concentrates on the advantages for humans only [45]. On the contrary, Lundqvist et al. in 2017 in their broad review of dog-assisted therapies in mental and cognitive illnesses as well as medical procedures reported little to moderate impacts on dogs in general, with the majority demonstrating no significant effect [27].

Dolphin-assisted treatment has generated even more debate than other types of animal-assisted therapy. Dolphins are one of the most exotic creatures utilized in treatment, yet they can have great results as a supportive strategy for encouraging patients to engage in rehabilitation activities. It is important to keep in mind, though, that no matter how well-planned these animals' living spaces are, they cannot take the place of their natural habitats. Additionally, accounts of dolphins acting aggressively against swimmers in their presence raise the possibility that such behavior is the result of dolphins experiencing persistent stress. These factors lead to the recommendation that dolphins should not be involved in AAT [2].

A balanced approach to animal-assisted therapy can be advantageous to both parties involved, keeping in mind both the well-being of patients and the welfare of animals.

Safety

Zoonotic infections and bites are potential concerns associated with pet ownership and AAT, but the actual frequency of such occurrences remains uncertain [46]. There is a crucial concern regarding the safety of people, especially about zoonotic infections, which are infections transmitted to humans from animals [8]. According to one review study, adolescents with sickle cell anemia who took part in an AAT program did not have any incidences of infection transmission and had lighter pain episodes than the control group [18].

Various concerns, such as sanitation, safety for both animals and children, allergies, cultural differences, and fear of dogs, are among the main justifications given for prohibiting animals in schools or hospitals [9]. In California, there was created a program named Pets Helping Us Recover, which has a strict application procedure. This involves lab testing for the dog as well

as an assessment and screening by a behaviorist. The dog must be groomed, cleaned, and have its ears cleansed before each visit to guarantee cleanliness and readiness for engagement [9]. All animals enrolled in such programs must undergo routine veterinarian examinations. This procedure makes sure that the animals don't experience excessive stress from constant interaction with kids, especially those who have demanding personalities. Parents, relatives, and therapists are all accountable for making sure therapy animals are completely vaccinated and kept in hygienic conditions. This safety measure is crucial to guard against any illnesses or injuries that can harm the program's caregivers as well as the children who are engaged [8].

Conclusion

Even though they cannot engage in the greatest levels of intellectual connection with people, animals may make fantastic companions and have a positive impact on those who maintain them and interact with them [8]. The evidence shows that animal-assisted therapy (AAT) may be very successful with a wide range of people in our society and in a lot of settings. For instance, bringing pets into classrooms has had observable and extremely rewarding benefits [9].

Both adults and children may experience emotions of serenity and optimism when animals are present during therapy, which promotes patient-therapist trust and aids in the accomplishment of therapeutic objectives [1]. However, it's worth noting that research in this field is relatively young and yet limited [9]. Despite the scarcity of data in this area, AAT as well as just pet ownership are likely to develop because of the favorable subjective sentiments toward animals that many people experience [46].

Referring to the safety concerns, although theoretical risks exist, more research is needed to understand the actual occurrence of zoonotic infections and bites in the context of pet ownership and animal-assisted therapy. Implementing proper safety measures and monitoring can help address these concerns and ensure the well-being of both humans and animals involved in these programs.

Authors Contributions:

All authors attest that each author has made an important scientific contribution to the study. Writing, review, and editing: D.S., J.F, M.M., U.Ž., Z.L, E.S. All authors have read and agreed with the published version of the manuscript.

Conflict of Interest:

No conflict of interest was declared by the authors.

Financial Disclosure:

The authors declared that this study has received no financial support.

References

1. Koukourikos K, Georgopoulou A, Kourkouta L, Tsaloglidou A. Benefits of animal assisted therapy in mental health. *International journal of caring sciences*. 2019;12(3):1898-1905.
2. Kapustka J, Budzyńska M. The use of various animal species for therapeutic purposes in Poland: current perspectives. *Acta Scientiarum Polonorum Zootechnica*. 2020;19(2):3–10. <https://doi.org/10.21005/asp.2020.19.2.01>
3. Damron WS. *Introduction to animal science*. Pearson Higher Education. 2013.
4. Beseres M. *Unintended Rehabilitation: A Comparative Analysis of Prison Animal Programs*. 2017. Retrieved from Sophia, the St. Catherine University repository website: https://sophia.stkate.edu/msw_papers/713
5. Bachi K, Parish-Plass N. Animal-assisted psychotherapy: A unique relational therapy for children and adolescents. *Clinical Child Psychology and Psychiatry*. 2017;22(1):3–8. <https://doi.org/10.1177/1359104516672549>
6. Serpell JA. Animal-assisted interventions in historical perspective. *Handbook on Animal-Assisted Therapy*. 2010;17–32. <https://doi.org/10.1016/b978-0-12-381453-1.10002-9>
7. Jagielski D, Jagielska A, Pyszora A. Dogoterapia – historia, założenia, cele. Propozycja zastosowania w opiece paliatywnej [Dog-assisted therapy as a proposed intervention in palliative care. Its history, premises and treatment objectives]. *Medycyna Paliatywna w Praktyce*. 2014;8(4):163–167. Polish
8. Min M, Omar M. A Review on animal-assisted therapy and activities for healthcare and teaching of children. *Journal of Education and Social Sciences (JESOC)*. 2016;5:40-46.
9. Dolesy Bugenhagen EA. *Benefits of Animal Assisted Therapy With Children in Special Education* (Master’s thesis, Bethel University). 2018. Retrieved from Spark Repository: <https://spark.bethel.edu/etd/171>

10. Banman JK. Animal-Assisted Therapy with Adolescents in a Psychiatric Facility. *Journal of Pastoral Care.* 1995;49(3):274–278. <https://doi.org/10.1177/002234099504900305>
11. Fine AH. Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice. Academic Press (Elsevier), USA. Third edition. 2010.
12. Siporin S. Talking horses: Equine psychotherapy and intersubjectivity. *Psychodynamic Practice.* 2012;18(4):457–464. <https://doi.org/10.1080/14753634.2012.719744>
13. Rekun-Gregorczyk A, Zastosowanie felinoterapii w leczeniu osób starszych. [Felinotherapy in elderly people]. *Gerontologia Współczesna.* 2014;2:91-93. Polish. Retrieved from <http://31.186.81.235:8080/api/files/view/42470.pdf>
14. Ketter K. Changing the World Through AAI: The History of Pet Partners - Pet Partners. Pet Partners. 2023. Retrieved from <https://petpartners.org/changing-the-world-through-aaai-the-history-of-pet-partners/> Access 07.2023.
15. Pet Partners, <https://petpartners.org/learn/terminology/> Access: 07.2023.
16. Crippa A, Gonçalves dos Santo Feijó A. Animal- assisted activity as a complementary alternative to patient's treatment: search for scientific evidence. *Revista Latinoamericana de Bioética.* 2014;14(1):14-25.
17. Chur-Hansen A, Zambrano SC, Crawford GB. Furry and Feathered Family Members—A Critical Review of Their Role in Palliative Care. *American Journal of Hospice and Palliative Medicine.* 2013;31(6):672–677. <https://doi.org/10.1177/1049909113497084>
18. Çakici A, Kök, M. Animal Assisted Therapy. *Psikiyatride Güncel Yaklaşımlar.* 2020;12(1):117–130. <https://doi.org/10.18863/pgy.526378>
19. Rode B. Zwierzęta w życiu osób z zespołem Aspergera. Relacje, emocje i satysfakcja z życia. [Animals in life of people with Asperger syndrome. The relationships, the emotions and life-satisfaction.] *Życie Weterynaryjne.* 2017;9:645-648, Retrieved from <https://vetpol.org.pl/dmdocuments/ZW-09-2017-01.pdf>
20. Odendaal J. Animal-assisted therapy — magic or medicine? *Journal of Psychosomatic Research.* 2000;49(4):275–280. [https://doi.org/10.1016/s0022-3999\(00\)00183-5](https://doi.org/10.1016/s0022-3999(00)00183-5)
21. Friedmann E, Thomas SA. Pet ownership, social support, and one-year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial (CAST). *The American Journal of Cardiology.* 1995;76(17):1213–1217. [https://doi.org/10.1016/s0002-9149\(99\)80343-9](https://doi.org/10.1016/s0002-9149(99)80343-9)

22. McConnell AR, Brown CM, Shoda TM, Stayton LE, Martin CE. Friends with benefits: On the positive consequences of pet ownership. *Journal of Personality and Social Psychology*. 2011;101(6):1239–1252. <https://doi.org/10.1037/a0024506>
23. Goleman M, Drozd L, Karpiński M, Czyżowski P. Felinoterapia jako alternatywna forma terapii z udziałem zwierząt [Cat therapy as an alternative form of animal-assisted Therapy]. *Medycyna Weterynaryjna*. 2012;68(12):732–735. Polish. Retrieved from <http://www.medycynawet.edu.pl/images/stories/pdf/pdf2012/122012/201212732735.pdf>
24. Kokocińska AM. Zooterapia z elementami etologii [Animalotherapy with ethology elements]. Wydawnictwo Impuls, Kraków. 2017. Polish
25. Charry-Sánchez JD, Pradilla I, Talero-Gutiérrez C. Animal-assisted therapy in adults: A systematic review. *Complementary Therapies in Clinical Practice* 2018;32:169–180 <https://doi.org/10.1016/j.ctcp.2018.06.011>
26. The Polish Society of Kynotherapy (PTK, Polskie Towarzystwo Kynoterapeutyczne) <https://www.kynoterapia.eu/standardy-3>, Access 06.2023.
27. Lundqvist M, Carlsson P, Sjö Dahl R, Theodorsson E, Levin LK. Patient benefit of dog-assisted interventions in health care: a systematic review. *BMC Complementary and Alternative Medicine*. 2017;17(1):358 <https://doi.org/10.1186/s12906-017-1844-7>
28. Hansen KM, Messinger CJ, Baun MM, Megel M. Companion Animals Alleviating Distress in Children. *Anthrozoös*. 1999;12(3):142–148. <https://doi.org/10.2752/089279399787000264>
29. Reading With Rover. <https://www.readingwithrover.org>, Access 05.2023.
30. What Is R.E.A.D.? <http://www.readdogsmn.org/>, Access: 06.2023.
31. Cieśla A, Mazan J. The effect of Animal-Assisted Activities (AAA) involving a dog on pre-school children in the light of their parents' opinions. *Acta Scientiarum Polonorum Zootechnica*. 2015;14(4):33-42. Retrieved from <https://bibliotekanauki.pl/articles/45125.pdf>
32. Budzińska-Wrzesień E, Wrzesień R, Jarmuł-Pietraszczyk J, Świtacz A. Therapeutic role of animals in human life—examples of dog and cat assisted therapy. *Ecological Chemistry and Engineering*. A. 2012;19(11):1375-1381. [https://doi.org/10.2428/ecea.2012.19\(11\)133](https://doi.org/10.2428/ecea.2012.19(11)133)
33. Gasińska M, Krupiński J, Należyty M, Paszkiewicz A, Smolak W, Solecka I, Strumińska A, Ustjan D, Woińska M. Kanony Polskiej Hipoterapii. *PTHip*. 2007.

Polish.

Retrieved

from

http://www.pthip.org.pl/files/KANONY_POLSKIEJ_HIPOTERAPII.pdf

34. Equine Therapy Programs - Equestrian Therapy. <https://www.equestriantherapy.com/equine-therapy-programs/> Access: 03.2023.
35. Kolarczyk E, Markiewicz-Łoskot G, Jaromin J. Hippotherapy – an effective multi-profile treatment? *Annales Academiae Medicae Silesiensis*. 2016;70:177–183. <https://doi.org/10.18794/aams/62991>
36. Macauley BL, Gutierrez KM. The Effectiveness of Hippotherapy for Children With Language-Learning Disabilities. *Communication Disorders Quarterly*. 2004;25(4):205–217. <https://doi.org/10.1177/15257401040250040501>
37. Buchnat M, Rzepka M. Delfinoterapia w usprawnianiu dzieci z zaburzeniami w rozwoju – dylematy i kontrowersje. [Dolphin-Assisted Therapy as an alternative form of support of child development – dilemmas and controversies] *Interdyscyplinarne Konteksty Pedagogiki Specjalnej*. 2015;1:73-85. Polish. <https://doi.org/10.14746/ikps.2013.1.04>
38. Brensing K, Linke K, Todt D. Can dolphins heal by ultrasound? *Journal of Theoretical Biology*. 2003;225(1):99–105. [https://doi.org/10.1016/s0022-5193\(03\)00225-x](https://doi.org/10.1016/s0022-5193(03)00225-x)
39. Edwards NE, Beck AM. Animal-Assisted Therapy and Nutrition in Alzheimer’s Disease. *Western Journal of Nursing Research*. 2002;24(6):697–712. <https://doi.org/10.1177/019394502320555430>
40. Gardiánová I, Hejrová P. The use of small animals - mammals, birds, fish in zootherapy. *Kontakt*. 2015;17(3):e171–e176. <https://doi.org/10.1016/j.kontakt.2015.08.008>
41. Morales Villavicencio A. Chów alpaka [Alpacas’ husbandry]. Multico Oficyna Wydawnicza, Warszawa. 2010. Polish.
42. Camillo F, Rota A, Biagini L, Tesi M, Fanelli D, Panzani D. The Current Situation and Trend of Donkey Industry in Europe. *Journal of Equine Veterinary Science*. 2018;65:44–49. <https://doi.org/10.1016/j.jevs.2017.11.008>
43. De Rose P, Cannas E, Reinger Cantiello P. Donkey-assisted rehabilitation program for children: a pilot study. *Annali dell'Istituto superiore di sanita*. 2011;47(4):391–396. https://doi.org/10.4415/ANN_11_04_11
44. Navas González FJ, Jordana Vidal J, León Jurado JM, McLean AK, Delgado Bermejo JV. Dumb or smart asses? Donkey’s (*Equus asinus*) cognitive capabilities share the heritability and variation patterns of human’s (*Homo sapiens*) cognitive capabilities.

Journal of Veterinary Behavior. 2019;33:63–74.
<https://doi.org/10.1016/j.jveb.2019.06.007>

45. Palestrini C, Calcaterra V, Cannas S, Talamonti Z, Papotti F, Buttram D, Pelizzo G. Stress level evaluation in a dog during animal-assisted therapy in pediatric surgery. Journal of Veterinary Behavior. 2017;17:44–49.
<https://doi.org/10.1016/j.jveb.2016.09.003>
46. Cherniack EP, Cherniack AR. The benefit of pets and animal-assisted therapy to the health of older individuals. Current Gerontology and Geriatrics Research. 2014;1–9.
<https://doi.org/10.1155/2014/623203>