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Animal-Assisted Therapy in Pediatric Care

A qualitative descriptive literature review

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<p>The qualitative descriptive literature review was conducted to describe effects of animal-assisted therapy and its challenges on pediatric care. The study aimed to provide new knowledge that can be applied in pediatric health care regarding the effects and associated challenges of animal-assisted therapy.</p> <p>Data was gathered from Cinahl and PubMed, resulting in the selection of eleven articles published between 2016 and 2024. These articles were assessed for relevance using the JBI tool. The data was subsequently examined using inductive content analysis.</p> <p>The findings highlight the key benefits that can be expected from animal-assisted interventions, as well as the challenges that may arise during therapy delivery. The positive effects include improvements in physical health, emotional and psychological well-being, therapeutic engagement, behavioral benefits, and social benefits. Conversely, the challenges faced during animal-assisted interventions include legal and ethical issues, physiological barriers, unfamiliarity with animals and their behavior, complexities in the healthcare treatment process, lack of literacy, skills, and resources, financial barriers, and environmental issues.</p> <p>The thesis was reviewed using the Turnitin program, yielding a similarity percentage of 11%, which falls within the acceptable range.</p>	
Keywords	animal-assisted therapy, paediatric, healthcare.

Contents

1	Introduction	1
2	Background and key terms	2
2.1	History of animal-assisted therapy	2
2.2	Animal-assisted therapy	3
2.3	Positive effects of animal-assisted therapy	3
3	Purpose, aim and research questions	4
4	Methodology and methods	4
4.1	Data collection method	5
4.2	Data search and selection	5
4.3	Data analysis method	9
5	Results	11
5.1	Effects of Animal-Assisted Therapy in pediatric care.	11
5.1.1	Physical health	11
5.1.2	Emotional and psychological benefits	13
5.1.3	Therapeutic engagement	16
5.1.4	Behavioural improvement	17
5.1.5	Social benefits	17
5.2	Challenges of animal-assisted therapy in pediatric care.	18
5.2.1	Legal and ethical issues	18
5.2.2	Participants health and safety	18
5.2.3	Physiological barriers	19
5.2.4	Psychological barriers	19
5.2.5	Animal behaviour	20
5.2.6	Financial issues	20
5.2.7	Barriers to participation	20
5.2.8	Insufficient literacy, skills, and resources in AAT	21
5.2.9	Environmental challenges	21
6	Discussion	21
6.1	Main result	21
6.2	Ethics	23
6.3	Validity	24
6.4	Conclusions and utilization of the results and recommendations	25

References	25
Appendices	1

Appendices

Appendix 1. Database search results

Appendix 2. Results of the content analysis (Research question 1)

Appendix 3. Results of the content analysis (Research question 2)

1 Introduction

The future of our society depends on the health and well-being of its children. Therefore, it is required to identify effective therapeutic interventions beyond conventional treatments for children who face challenges such as physical, mental, social, and developmental disabilities, as well as chronic illnesses. Thus, exploring alternative therapies and developing compassionate, individualized teaching programs are crucial steps to empower children with special needs. (Min and Omar, 2016: 40.) Moreover, hospitalization can be a highly stressful and emotionally taxing experience for both children and their families. The unfamiliar hospital environment can evoke feelings of uncertainty, loneliness, and fear in children. Additionally, pain, anesthesia, and other medical procedures, both before and after surgery, can contribute significantly to a child's anxiety. These negative experiences can be particularly pronounced for children undergoing treatment in pediatric oncology or intensive care units. (Rodriguez et al, 2022: 1)

Animal-Assisted Therapy (AAT) utilizes in recreational and social context, while involves trained animals into a patient's treatment plan. These interventions can be effectively applied to the treatment and rehabilitation of children recovering from illness or injury. Moreover, researchers suggest that pet-facilitated therapy offers a multiple benefit for children including mental, physical and social aspects. Mentally these interventions provide comfort, entertainment and reduced anxiety. Physically, potential benefits include lower blood pressure and cholesterol, improved body fitness, reduced pain and a decreased need for medication. Socially, pet therapy can alleviate loneliness and isolation, foster communication with non-judgmental acceptance and boost self-esteem in troubled children. Furthermore, studies indicate the efficacy of animal-assisted therapy in children with specific conditions such as autism, epilepsy, cancer, brain, aneurysm, disabilities, and other chronic illnesses (Min and Omar, 2016: 40-41)

The purpose of the study is to describe the application of animal-assisted therapy and its positive effects on paediatric care. The aim of this research is to provide new knowledge that can be applied in nursing practice regarding the application of animal-assisted therapy and its positive effects.

2 Background and key terms

Numerous animal species have been employed in AAT programmes, including small animals (like dogs) and big animals (like horses), as well as wild and aquatic animals (like dolphins) (Serpell, Coppinger Fine and Peralta. 2010: 484). Furthermore, a range of locations, including universities, healthcare institutions, nursing homes, and hospitals, have utilized AAT programmes. These changes in the environment make AAT accessible to a variety of age groups, from kids to senior citizens (Lynch et al. 2014:817).

Children and teenagers in hospitals may experience a range of psychological and physical symptoms throughout therapy, such as fatigue, pain, anger, anxiety, irritability, depression, and sadness. Children may become more uncomfortable as a result, which may interfere with their therapy and decrease their quality of life (Zisk-Rony, Lev and Haviv, 2015: 111). Currently, physical touch and visual communication with animals are thought to be the mechanism behind AAT. These interactions affect biological, psychological, and social activities by releasing endorphins, serotonin, and oxytocin (McCune et al ,2020: 2).

2.1 History of animal-assisted therapy

Non-human animals have contributed greatly to the development of human understanding regarding the origins and remedies for various illnesses and health conditions. (Serpell, 2010: 19). In Greek mythology, during the reign of Asclepius, the god of medicine and health, dogs and snakes were significant components of healing procedures. It was thought that the sick and injured were visited and healed while they slept by the god, who would sometimes take the form of a human and most often a dog or snake (Rosso, 2023: 2-6). In Belgium, AAT began with the use of chickens and bunnies in 1790 to treat mental diseases. In the UK, York Retreat used animals for therapy for the first time on record in 1792. In 1867, individuals with epilepsy were treated in Germany with horses and farm animals. In 1942, farm animals helped create a soothing environment for patients at the Army Air Corps Convalescent Hospital in New York. Later, in 1973, the Humane Society launched the "petmobile" project, which was the first to connect elderly individuals with animals. Since the 19th century, animals have been utilized in animal therapy (AAT) to treat individuals with disabilities (Tedavi, 2020). Animals now play a vital role in both the natural environment and society (Serpell, 2010: 19).

2.2 Animal-assisted therapy

Throughout history, humans have benefited from animals in variety of ways, including as sources of transportation, food and other products. Using dogs to assist in human therapy is called Canine-Assisted Therapy (CAT) and using cats is named Feline-Assisted Therapy (FAT) are the most common forms of animal-assisted therapy utilizing dogs and cats. Equine-Assisted Therapy (EAT) for horse and Dolphin-Assisted Therapy (DAT) are additional examples. (Min and Omar, 2016: 40).

Animals may utilized AAT, particularly if they are domestic animals that have been educated. Due to their social abilities and trainability, dogs make excellent therapy animals (Santaniello et al, 2021: 2). In addition to being helpful in providing animal aid, the encounters with farm animals, dogs and puppies, rabbits, domestic cats, horses, and other animals also highlight the positive impacts of animal interaction for healing and social adaptation. Therapy cases involving fish, horses, birds, and dolphins are documented in the literature (Chandler, 2022: 452).

2.3 Positive effects of animal-assisted therapy

Animal-assisted therapy (AAT) serves as a supplemental psychosocial therapy for the management of symptoms. With AAT, children welcome it spontaneously and happily, which speeds up the healing process because it focuses on their feelings rather than their symptoms (Santaniello, Garzillo, Cristiano, Fioretti and Menna, 2021: 2). Providing an enjoyable and humanising experience with an animal to improve pleasure and human-animal connection is the main social outcome of AAT. It breaks up the monotonous routine of hospital life, makes the day more cheerful, and fosters relationships and interactions between humans and animals (McCune et al, 2020: 2).

Currently, physical touch and visual communication with animals are believed to be the mechanisms behind AAT. These interactions affect biological, psychological, and social activities by releasing endorphins, serotonin, and oxytocin. The relationship between humans and animals enhances coping mechanisms like stress management, interpersonal sensitivity, and negative emotion processing. It also boosts satisfaction with life and peacefulness (Shen, Xiong, Chou, and Hall, 2018: 204).

Positive attitudes and emotions of adolescent patients occur with AAT during their hospital stays (Brown et al.2020). AAT therapy can lower cortisol levels, blood pressure,

and heart rate; improve mood and lessen despair; have a favourable impact on empathy, perception of pain, and aggressive behaviour; and increase motivation and focus in both adults and children (Beetz, 2017: 141). Children with insecure attachment resulting from abuse and exploitation benefit from AAT with dogs, hamsters, parrots, and mice, highlighting the positive impacts of these animals. (Çakıcı, and Kök, 2020: 118).

Key terms: animal-assisted therapy, paediatric, healthcare.

3 Purpose, aim and research questions

The purpose of the study is to describe the effects of animal-assisted therapy and its challenges on pediatric care.

The aim of this study is to provide new knowledge that can be applied in pediatric health care regarding the effects and associated challenges of animal-assisted therapy.

Research questions

1. What are the effects of animal-assisted therapy in paediatric care?
2. What are the challenges of animal-assisted therapy in paediatric care?

4 Methodology and methods

Nursing and healthcare policies and practices have greatly benefited from the use of qualitative research designs. A descriptive literature review methodology is used in this study to generate trustworthy information to address its research topic. While descriptive approaches are frequently used in nursing research, there is a lack of methodological guidelines for this design type in research literature or textbooks. A qualitative descriptive design may be the most suitable choice, as it recognizes the subjective aspects of the topic, captures the diversity of participant experiences, and presents the findings in language that either directly aligns with or closely mirrors the original research question. (Doyle, McCabe, Keogh, Brady, and McCann, 2020: 447-448).

Research in several areas is commonly conducted using qualitative and descriptive methodologies. There are situations where the terms descriptive and qualitative research are used interchangeably. Nevertheless, these two can be contrasted with one another. The use of naturalistic data is a key component of both study approaches. A descriptive study aims to provide an explanation for a phenomenon and its features (Springer, 2009: 263-265). Most research on etiology is explanatory or predictive in nature. Reviews of explanatory or predictive studies aim to enhance our understanding of the relationship between health-related events or outcomes by exploring the connections between different factors. (Moola et al.,2015: 164).

Consequently, this review will address the following components. The abbreviation for population, interest, and context is PICo. Finding keywords that matched the goals of the descriptive literature review was made easier with the use of PICo. Additional assistance from PICo was provided in choosing papers that directly addressed the study questions.

Table 1 PICo tool

P - Population	I – Intervention	Co - Context
Children OR Kids OR Young	Animal-assisted therapy OR Animal-assisted activities	Healthcare OR Wellbeing

4.1 Data collection method

This study explores the use of animal-assisted therapy and its benefits for paediatric healthcare. An investigation of the content in 10 chosen articles will form the basis of the study. Animal-assisted therapy in paediatric care will be the main topic of analysis.

4.2 Data search and selection

The search will be conducted through the following electronic databases: CINAHL and PUBMED, All primary research articles published in 2018–2024 related to the effects of

Animal Assisted Therapy. Health care setting OR clinic OR hospital OR acute setting
OR ICU

Table 1. Database search results

Database	Search sentence	Total number of hits	Pa-pers/rec-ords in-cluded based on title	Pa-pers/re-cords in-cluded based on ab-stract	Pa-pers/re-cords in-cluded based on full text
CINAHL	children OR adolescents OR youth OR child OR teenager OR pediatric OR paediatric OR kids AND animal assisted therapy OR pet therapy OR animal therapy OR animal intervention OR animal assisted activity AND health care setting OR clinic OR hospital OR ward OR acute setting OR ICU	53	41	21	05
PUBMED	children OR adolescents OR youth OR child OR teenager OR pediatric OR paediatric OR kids AND animal assisted therapy OR pet therapy OR animal therapy OR animal intervention OR animal assisted activity AND Health care setting OR clinic OR hospital OR ward OR acute setting OR ICU	432	156	24	06

Limiters	Years 2016-2024, English language, peer reviewed				
Records in total		485	197	45	11
Total number of included studies					11

The interview technique will involve semi-structured interviews that are audio and video recorded, targeting a population of children. Questionnaires and observations will also be used. Using the content analysis approach, transcripts will be examined both deductively and inductively.

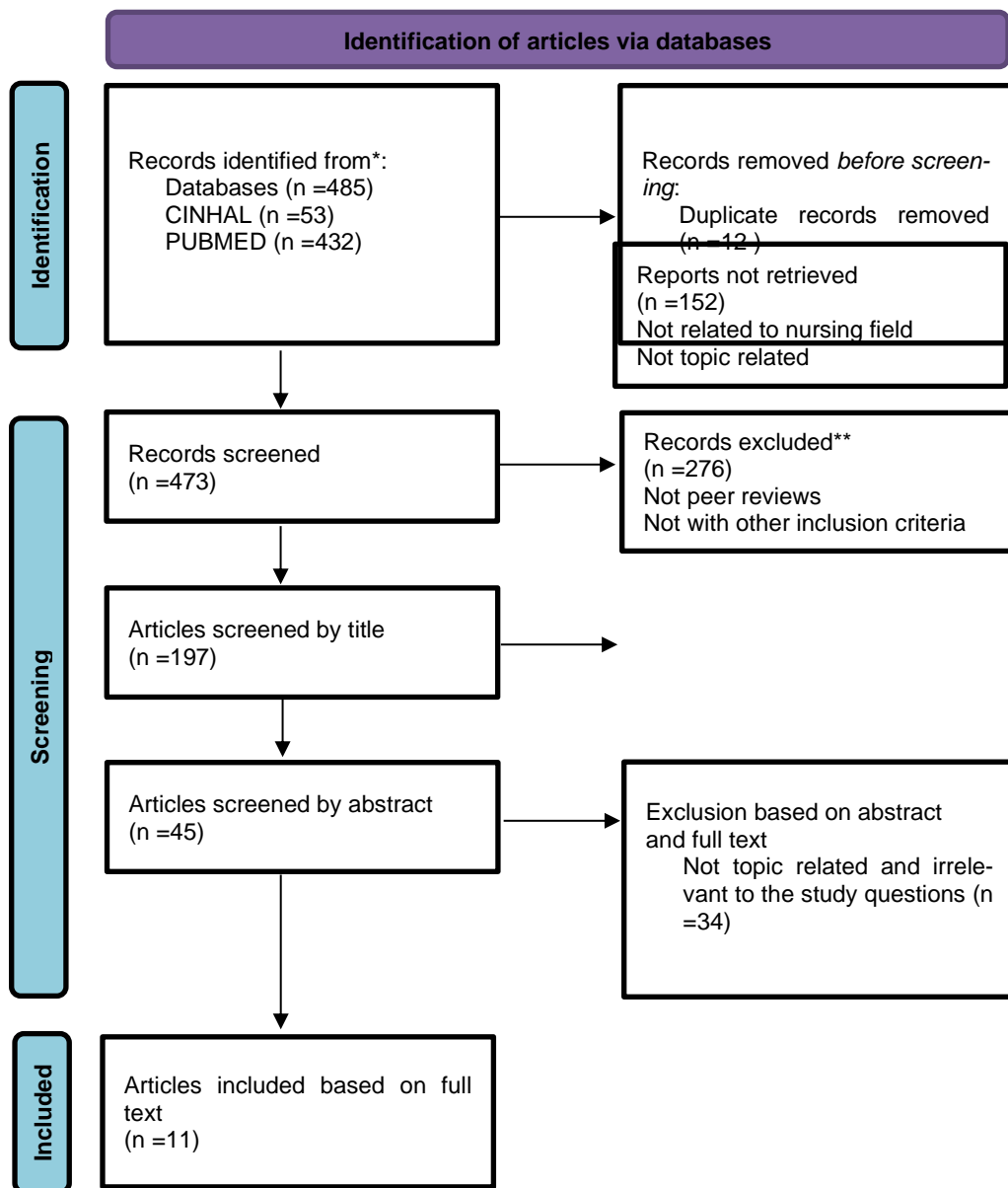


Figure 1. PRISMA flow chart

Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., Tetzlaff, J.M., Akl, E.A., Brennan, S.E. and Chou, R. 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews.

Utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) helps to avoid issues in writing. (Selçuk, 2019: 57). In 2020, further standards were added to the 27 checklists included in PRISMA 2009 (Page et al.2021: 2).

The justification, database, meta-analysis, and conclusions' ramifications are all included in these criteria. A PRISMA flow diagram will be used in this study to illustrate the technique that was adopted for the selected articles.

To improve the accuracy of the results in developing more pertinent information for the research topic, inclusion, and exclusion criteria (Table 2) were developed.

Table 2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Age below 19	Age more than 19
No fear or allergy to animals	Fear or allergy to animals
Healthcare setting	Other than healthcare setting
Children who were interested in AAT	Children who were interested in AAT
Studies published in English	Language other than English
Published between 2016 – 2024	Published before 2016
Peer reviewed articles	Non-peer reviewed articles

4.3 Data analysis method

The process of analysing data in this study will make use of content analysis tools. The research technique for content analysis is explained in depth, together with its methods, instances of its use, and contentious topics related to its implementation. The goal of content analysis is to achieve external validity, unlike purely qualitative designs. Research focused on the practice and education of nurses and other helping professions often centers around content analysis, which highlights human communication, practical relevance, potential, and applicability. (Downe-Wamboldt. 2009:314-316).

Addressing the study topic, choosing a sample or samples for analysis, and focusing on conceptual content analysis are all crucial elements of content analysis. Work will be divided into digestible content categories based on the coding of individual words or patterns that support the study issue. The information gathered via semi-structured interviews, field study notes, conversations, and electronic source material will be coded. To further summarize the data, the text can be categorised into additional "code categories" once it has been placed into code categories (Downe-Wamboldt. 2009:314-316).

Table 3 Inductive content analysis example

Meaning Unit	Coding	Sub-category	Generic category	Main category
After therapy, the rate of well-being increased to very good, median 10 (range 4-10), mean 9.17 (SD 1.43) (P < .001) (Nilsson et al. 2019:4)	Rate of well-being increased.	Improving well-being	Physical health	Effects of animal assisted therapy in pediatric care
The child did not wish to participate (n = 4);	child did not wish to participate	child unwilling to take part	Legal and ethical issues	Challenges of AAT
No consent was given by parents/guardians. (Ávila-Álvarez et al. 2020)	No parents' or guardian consent			

5 Results

Eleven articles were selected for this descriptive literature review from databases which were Cinahl and Pubmed. The articles that satisfied the inclusion criteria and published in the English language between 2016-2024 were selected. A search strategy identified four articles from Cinahl and six articles from Pubmed. Appendix 2 describes how d critical analysis was applied to validate significance and relevance to the research. Geographically, three studies were from Spain, three from Turkey, two from Sweden, one from USA and one from Australia. As for the data designs, there were three quasi-experimental studies, three randomized controlled trials, two mixed methods, one cross-sectional study and one survey.

The collected data were analyzed according to the research questions and ultimately organized into two main categories. Using inductive content analysis, n= 12 generic categories, n=29 sub-categories, and n=2 main categories were formed. The two main categories were, effects of animal assisted therapy which resulted from 5 generic categories and 19 sub-categories(Appendix 3) and challenges of animal assisted therapy which resulted from 7 generic categories and 10 sub-categories(Appendix 4).

5.1 Effects of Animal-Assisted Therapy in pediatric care.

The analyzed data revealed that physical health, emotional and psychological benefits, therapeutic engagement, behavioural improvement and social benefits are the effects of animal-assisted therapy in pediatric care.

5.1.1 Physical health

Animal-assisted therapy revealed mostly positive experiences after therapy in qualitative data, with participants reporting that their physical and mental well-being improved. Additionally, quantitative data presented significant positive responses regarding physical well-being. Overall, there was a notable betterment of participant's well-being. (Nilsson et al, 2019:4-6): (Trujillo et al, 2019: 311). Animal-assisted therapy can be utilized for calming and distraction prior to procedures and operations, provide comfort to long-term

hospitalized patients those who undergoing rehabilitation and aiding in physical recovery. (Yap et al, 2017: 49)

Animal-assisted therapy supports the reduce pain in hospitalized children. According to the Wong-Baker scale pain scores were significantly decreased after the intervention. This scale is a subjective tool featuring drawings of faces depicting varying levels of pain intensity (ranging from 0 to 10 points). It is utilized for patients aged 3 to 7 years, who select the face that best represents how they are feeling. For patients who were outside of intensive care units, pain scores significantly decreased from 3.5 to 0 points after the therapy according to the Visual Analog Scale (VAS) (López-Fernández et al, 2023: 846-848). The children described how the pain was reduced by distraction by having a dog around. (Nilsson et al, 2019:5). Children who engaged with the fish and turtle group showed reduced pain both during and after the IV insertion procedure. (Sarman & Tuncay, 2024:119.)

When children and dogs interacted with each other it was positively affected the children physically. (Nilsson et al, 2023:3). The blood pressure measurement prior and post their interaction with animals, in the intervention group was statistically difference was identified in between the systolic and diastolic blood pressure readings. (Demiralay & Keser 2022: 6). Child's improvement in physical health has shown by the way he interact with staff more confidently after intervention. Health improved with disappearing pain completely after therapy. (López-Fernández et al, 2023: 848)

In the stage of facilitating the interaction, the child was actively participated and interacted with dog. The instructor provided guidance to the intervention throughout. (Nilsson et al, 2023:4). A study suggest that canine would assist in physical rehabilitation to support patients with gait control, improving movement and functional skills. Additionally, encouraging coordination and muscle building are another advantages. Animal assisted therapy could be utilize to complement physical therapy or rehabilitation activities(92%), especially like in cerebral palsy patients can motivate to move in animal-assisted interventions. (Yap et al, 2017: 48-49)

The instructor first gauged child's comfort and then gave her the dog's toys. A sense of calm atmosphere appeared, both before and after any active play. By improving the comfort and quietness the child almost fell asleep. (Nilsson et al,

2023:4). Nearly two-thirds (8/14) of participants in the animal-assisted therapy, fostering a sense of comfort and safety during the therapy. (Trujillo et al, 2019: 311-312). Open-ended questions of the survey overwhelmingly mirrored positive experiences that participants regularly stated feeling of more comfortable or at ease during therapy sessions, means that therapy dog played a significant role in enhancing children's consolation. (López-Fernández et al, 2023: 848). Therapy dog's presence is calming and non-judgmental. This lack of judgment generate safe environment for patients. Without having any criticism or tension, patient can express feeling more comfortable, more relaxed and open environment conducive to healing. (Guzmán et al, 2022:7)

5.1.2 Emotional and psychological benefits

According to the Stirling Children's Well-being Scale hospitalized children who underwent goldfish intervention presented significant improvement in emotional and psychological well-being compared to a control group. SCWBS is created by Liddle and carter (Liddle & Carter, 2015) is designed to assess the emotional and psychological well-being of children aged 8 to 15. It comprises 12 questions using a 5-point Likert scale. (Sarman & Günay 2023: 73). Moreover, parents and guardians reported significant improvements in their child's mood after the AAI intervention. Using the Kaminski et al., 2002 scale, they observed a marked decrease in overall mood distress. The most noticeable improvement was in the child's relaxation level (Ávila-Álvarez et al,2020:9). Animal-Assisted Therapy (AAT) has been shown to benefit individuals with Cerebral Palsy (CP), Autism Spectrum Disorder (ASD), and Acquired Brain Injury (ABI) in various ways. For those with CP, AAT can aid in physical rehabilitation, improving movement, coordination, and muscle strength. Emotional support is another key benefit. People with ASD and ABI often reported that AAT helped regulate emotions, reduce anxiety, and manage behaviour. Common benefits across all three groups included companionship and improved mood, morale, and motivation. (Yap et al, 2017: 48).

The children expressed excitement and happiness at the prospect of encountering a dog in the hospital. They found the visit enjoyable, appreciating the comfort and fun of petting and playing with the dog, particularly enjoying a game involving dice. Observations revealed that the dog's behavior elicited positive reactions, making the children smile and laugh. The children showed joy through spontaneous smiles and laughter,

often talking directly to the dog, praising her as a "good girl," or referring to her as a friend during play. Furthermore, the children interacted non-verbally with the dog and instructor using gestures, body language, and various sounds. During play, they spoke positively about their enjoyment of interacting with the dog (Nilsson et al, 2023:4).

The children described the dog as nice, kind, calm, and obedient, noting that she followed their requests well. One 18-year-old boy wrote, "The dog was nice, funny, and obedient." They also perceived the dog as large. This interaction between the children and the dog had a positive emotional impact on the children, demonstrating that their engagement with the dog significantly improved their emotional well-being (Nilsson et al, 2019:5; Nilsson et al, 2023:3). Furthermore, there were notable statistical differences in emotional outbursts on days when Dog-Assisted Therapy (DAT) was conducted compared to days without it, with higher scores of outbursts on non-DAT days ($M = 1.71$; $SD = 2.49$) than on DAT days ($M = 0.48$; $SD = 0.68$), as indicated by the t-test results $t(20) = -2.77$, $p = 0.012$). In therapy, dogs act as non-judgmental facilitators, contributing to improvements in both behavioural and emotional aspects, leading to a more relaxed state in individuals (Guzmán et al., 2022, p. 7). Animal-Assisted Therapy (AAT) is primarily used as a comfort measure to prevent emotional outbursts and to calm patients before operations or procedures. It is especially advantageous for patients with extended hospital stays, such as those in rehabilitation, as it supports their mental recovery. AAT provides emotional support and a calming presence, making it an effective tool in various therapeutic settings (Yap et al., 2017, p. 49).

Animal-Assisted Therapy (AAT) helps improve children's confidence through physical interactions with the dog. Initially, children may start with tentative patting or scratching, gradually becoming more confident in their touch. It is particularly beneficial for patients with prolonged hospitalizations, such as those undergoing rehabilitation, as it aids in their mental recovery. Some children may quietly lie in bed while the dog rests its head on their arm or leg, offering comfort through its presence. At more interactive levels, the children show confidence both during active play and in moments of relaxation, where the dog's physical closeness has a soothing and calming effect on them. (Nilsson et al, 2023:3-4).

Based on the post-test and follow-up evaluations of children in both the intervention and control groups, it was found that the average total Perceived Stress Scale (PSS)

scores gradually declined in both groups. However, this reduction was statistically significant in the intervention group ($p < 0.05$), demonstrating that Animal-Assisted Therapy (AAT) effectively reduces stress. In contrast, the change in the control group was not statistically significant ($p > 0.05$), underscoring the specific impact of AAT in relieving stress. (Demiralay & Keser, 2022: 5.)

Children who interacted with fish and turtles displayed significantly lower anxiety scores during and after IV insertion compared to the control group. The control group had similar anxiety levels before and after IV insertion, with the highest anxiety occurring during the procedure ($M2 > M1 = M3$). In contrast, children in the fish and turtle groups exhibited the lowest anxiety after IV cannula insertion, demonstrating the effectiveness of animal interaction in reducing anxiety. (Sarman & Tuncay, 2024:119). Moreover, there was a statistically significant reduction in anxiety levels on the m-YPAS (Modified Yale Preoperative Anxiety Scale), decreasing from 32 points [IQR 31–38] before the intervention to 23 points [IQR 23–24] afterward ($p = 0.027$). Fear assessment also showed a notable decline on the CMFS (Child Medical Fear Scale), dropping from 1 point [1, 2] to 0 points ($p = 0.01$). Qualitative feedback highlighted that interaction with animals provided distraction, calmness, and comfort, making it an effective non-pharmacological treatment for anxiety while also enhancing the well-being of the healthcare personnel involved in the therapy. (López-Fernández et al, 2023: 846-848). Furthermore, a post-test conducted on the third day showed a statistically significant difference in the mean anxiety scores ($t = -2.403$, $p < 0.05$). In the intragroup comparison, the average anxiety scores of the children in the study group steadily declined, with the difference between the pre-test, mid-test, and post-test anxiety scores being statistically significant. (Sarman & Günay 2023: 73)

Animal-assisted therapy (AAT) was found to effectively reduce fear in children undergoing IV insertions. Specifically, children in the fish and turtle groups demonstrated significantly lower fear scores compared to the control group. The control group experienced consistently high fear levels before and after the IV insertion, with the peak fear occurring during the procedure itself. In contrast, the children who participated in the fish and turtle interventions experienced the lowest levels of fear following the IV insertion, indicating that AAT significantly alleviates fear associated with the procedure (Sarman & Tuncay, 2024:120).

Animal-assisted therapy (AAT) was reported by nine out of twelve health professionals to enhance emotional regulation and management. They observed that patients became less defensive and resistant, making therapeutic interactions easier. The presence of animals contributed to a calmer demeanor and increased trust in therapists. One example highlighted was a girl with an attachment disorder who became psychomotorly agitated when her mother left; the presence of a dog calmed her, demonstrating the restorative effect of AAT on emotional self-regulation (Guzmán et al., 2022:7).

5.1.3 Therapeutic engagement

All participants aged five and older ($n = 46$) gave the highest possible rating to the activities involving dogs, selecting "a lot" as their response to enjoying the session. Additionally, the satisfaction level of parents or guardians was at its peak, with a median score of 10 out of 10. This high level of satisfaction suggests that incorporating animal-assisted interventions (AAI) could lead to higher attendance and greater engagement in treatment sessions (Ávila-Álvarez et al., 2020:9). The project received an overall satisfaction rating of 9.69/10. Participants rated their satisfaction at 9.53/10, and caregivers at 9.38/10. The open-ended survey responses were predominantly positive, highlighting the advantages of distraction from the intensive care setting, the spontaneous generation of smiles, and enhanced social interaction. This high level of satisfaction and positive feedback indicates that such interventions could lead to higher attendance and greater engagement in treatment sessions (López-Fernández et al., 2023:848). Statistically significant differences were observed in attendance rates between days with and without dog-assisted therapy (DAT). Attendance was notably higher on DAT days ($M = 98.04$; $SD = 2.21$) compared to non-DAT days ($M = 92.3$; $SD = 10.78$), with the difference being significant ($t(20) = 2.6$, $p = 0.016$). This suggests that incorporating DAT leads to higher attendance for treatments (Guzmán et al., 2022:6).

Children's perceptions of their hospital stay improved after participating in animal-assisted therapy. Although the median rating remained at 6, the distribution of ratings shifted positively, with a mean of 6.26 ($SD 2.90$), reflecting a significant improvement ($P = .002$). The experience of encountering a dog in the hospital was described as a positive and unexpected experience., making the time pass more quickly and enhancing their overall memories of the stay. One 12-year-old girl noted that the therapy made her hospital stay more enjoyable. The qualitative and quantitative data both showed a

significant increase in positive feelings towards the hospital stay after the therapy, suggesting that children might be more willing to stay in the hospital when such therapy is available (Nilsson et al., 2019:6).

The atmosphere during dog-assisted therapy (DAT) sessions was described as very pleasant, which contributed to improving treatment outcomes and the therapeutic relationship. One therapist recalled working with a patient who had been struggling with the therapeutic process. After introducing DAT, with three sessions involving the patient and her mother, there was a noticeable improvement in the therapeutic relationship. The patient became more motivated to attend the hospital, and the overall connection between the therapist and patient strengthened (Guzmán et al., 2022:8). Moreover, 76% of participants indicated that animal-assisted therapy (AAT) could be profitable as a supportive adjunct to speech language therapy. This suggests that AAT has the potential to enhance the effectiveness of speech therapy by complementing traditional approaches (Yap et al., 2017:49).

5.1.4 Behavioural improvement

Animal-Assisted Therapy (AAT) has proven effective in improving positive behavioral reactions, particularly in managing aggression and improving behavior in individuals with Autism Spectrum Disorder (ASD) and Acquired Brain Injury (ABI). Additionally, AAT is commonly used as a calming and distraction technique before medical procedures, helping patients, especially those facing long-term hospitalization, in both physical and mental recovery. The therapy is notably beneficial in preparing patients for clinician consultations and pre-operative situations, with a 80% percentage of effectiveness (Yap et al., 2017). The presence of the dog helped most children become calm and relaxed, displaying signs of fatigue (Nilsson et al., 2023).

5.1.5 Social benefits

Four participants reported an improvement in social interaction between patients and professionals, especially in children with autism, where social interaction and communication are often impaired. Through Dog-Assisted Therapy (DAT), children who previ-

ously struggled to express themselves began to engage more, even revealing experiences like bullying. Additionally, the DAT sessions created a warmer and more positive atmosphere in the unit (Guzmán et al., 2022). The interaction with the dog fostered mutual responsiveness, encouraging children to participate actively and confidently with their family members and the dog instructor. The children showed positive effects, such as warmth and relaxation during play and cuddling, highlighting improved social interaction and communication (Nilsson et al., 2023).

5.2 Challenges of animal-assisted therapy in pediatric care.

The data analysis revealed that legal and ethical issues, participants health and safety physiological barriers, psychological barriers, animal behaviour, barriers to participation, financial barriers, insufficient literacy, skills, and resources in AAT, and environmental challenges arise when completing the AAT.

5.2.1 Legal and ethical issues

According to the selected articles, one article emphasizes legal and ethical issues. One generic category was identified: No parental or guardian permission. The article highlighted that parents and guardians did not give consent for the children to participate in the AAT (Ávila-Álvarez et al. 2020: 9.)

5.2.2 Participants health and safety

AAT in pediatric care may be limited by certain physiological barriers, such as allergies. In one study, a participant was reported to have a known dog allergy, which prevented them from participating in the therapy sessions (Ávila-Álvarez et al. 2020: 9.)

The selected study noted that the potential barrier to the implementation of AAT is the concern about infection. Respondents highlighted the possibility of increased infection rates as a significant issue. This concern reflects the perceived risk that interactions with therapy animals might lead to higher infection rates, which could impact the adoption and integration of AAT in clinical settings (Yap et al. 2017: 49.)

5.2.3 Physiological barriers

The reviewed studies identified significant physiological barriers associated with AAT. Nilsson Funkquist, Edner & Engvall (2019) observed that, although children generally reported feeling calmer and experiencing increased fatigue after interacting with the therapy dog, one child noted that their pain could become somewhat exacerbated following more active engagement with the animal. Furthermore, the authors noted that while engagement with the therapy dog generally led to increased feelings of calmness and fatigue among the children, one participant reported a potential increase in pain following more active engagement with the animal. Specifically, this child indicated that their pain could be somewhat more pronounced after increased activity with the dog (Nilsson ,Funkquist, Edner & Engvall. 2019: 5.)

AAT presents specific physiological challenges, particularly for children who have recently experienced an acquired brain injury (ABI). One participant highlighted the importance of exercising caution when applying AAT in such cases, highlighting the vulnerability of the child's physical and mental condition during the initial phases of recovery (Yap et al. 2017: 48.)

5.2.4 Psychological barriers

The selected article highlighted that some children may experience significant physiological barriers to AAT due to their emotional reactions to animals. It was observed that certain children exhibited intense fear, anxiety, or unease around a dog, which could inhibit their participation in therapy sessions (Ávila-Álvarez et al. 2020: 9.)

Similarly, one article showed that other children demonstrated fear by physically moving away from the dog, indicating a high level of discomfort and anxiety around the animal (Nilsson, Engvall, Enskär, Edner & Funkquist, 2023: 4.)

Moreover, in a hospital setting, the fear of animals was specifically identified as a barrier to the implementation of AAT. This fear can lead to heightened stress and a reluctance to participate in therapy (Yap et al. 2017: 49.)

5.2.5 Animal behaviour

The behaviours of therapy animals can sometimes present challenges in Animal-Assisted Therapy (AAT). In some cases, children exhibited fear-based reactions, such as hurriedly moving away from the dog or expressing concerns about whether the dog might bite. These reactions suggest that certain behaviours of the therapy animal, even if benign, can provoke anxiety in paediatrics patients (Nilsson, Engvall, Enskär, Edner & Funkquist. 2023: 4.)

Additionally, feedback from clients highlighted specific undesirable behaviours of therapy dogs, such as begging or sniffing. Two clients expressed discomfort with these actions, indicating that such behaviours could disrupt the therapeutic environment and affect the overall experience of the therapy sessions (Trujillo et al. 2019: 311.)

5.2.6 Financial issues

In the context of hospital settings, cost has been identified as a significant barrier to the implementation of AAT. Financial considerations can impact the feasibility and sustainability of integrating AAT into routine care. Specifically, it has been suggested that the costs associated with maintaining and managing AAT programs could influence their successful implementation (Yap et al. 2017: 49.)

5.2.7 Barriers to participation

Several factors can impact the participation of children in AAT. One notable barrier was logistical conflicts; specifically, 5.2% of the children who met the study criteria and consented to take part were unable to attend the AAI sessions due to scheduling conflicts with their ongoing medical care (Ávila-Álvarez et al. 2020: 9.)

In addition to logistical issues, personal preferences and attitudes towards animals also played a role. Some children expressed a dislike for dogs, which influenced their willingness to engage in AAT sessions (Nilsson, Engvall, Enskär, Edner & Funkquist, 2023: 4.)

Despite these barriers, the study also observed positive outcomes in terms of interaction dynamics. The interaction with the therapy dog facilitated a mutual interplay, where the child responded to the dog's actions and, on their initiative, became more confident in interacting with both family members and the dog instructor (Nilsson, Engvall, Enskär, Edner & Funkquist, 2023: 4.)

5.2.8 Insufficient literacy, skills, and resources in AAT

In the context of implementing AAT, several barriers were identified. Despite 88% of participants being aware of AAT, approximately half reported having only limited knowledge about the therapy. This lack of detailed understanding extends to uncertainties about how AAT functions and its impact on the therapeutic process (Yap et al. 2017:48)

Furthermore, many professionals noted that they had not previously worked with AAT and lacked familiarity with its practical applications. This gap in practical experience affects their ability to effectively utilize the therapy in clinical settings (Guzmán et al. 2022: 8.)

5.2.9 Environmental challenges

The presence of staff during AAT sessions can significantly influence the therapeutic environment. One study highlighted that an excessive presence of staff during interventions can impact the overall atmosphere. For instance, a calmer work climate was reported on a particular day, benefiting both patients and healthcare professionals. This improved atmosphere, influenced by the staff presence and behavior, appeared to positively affect the patients as well (Guzmán et al. 2022: 8.)

6 Discussion

6.1 Main result

The purpose of this descriptive study was to describe the effects of animal-assisted therapy and identify challenges encountered during implementation of animal-assisted therapy on pediatric care.

The analysis identified two main categories: the effects of animal-assisted therapy and the challenges faced in its implementation within pediatric care. The first theme, focusing on the effects, revealed five generic categories: physical health, emotional and psychological benefits, therapeutic engagement, behavioral improvement, and social benefits. The second theme highlighted the challenges of implementing animal-assisted therapy, categorized into seven generic categories: legal and ethical issues, physiological barriers, unfamiliarity with animals and their behavior, integration with healthcare

treatments, lack of literacy, skills, and resources in AAT, financial constraints, and environmental challenges.

Animal-assisted therapy (AAT) demonstrates significant benefits across physical, emotional, psychological, therapeutic engagement, behavioral, and social domains. Physically, AAT enhances well-being by reducing pain, improving blood pressure, aiding in rehabilitation, and creating a calming atmosphere that fosters healing (Nilsson et al., 2019; Yap et al., 2017; López-Fernández et al., 2023). Children, particularly those undergoing medical procedures or long-term hospitalization, experience reduced pain and anxiety, leading to an overall improvement in their physical health (Sarman & Tuncay, 2024; Demiralay & Keser, 2022). Emotionally and psychologically, AAT boosts children's mood, reduces stress, and lowers anxiety, making it an effective non-pharmacological treatment for emotional regulation and anxiety management. This is particularly valuable for children with conditions like cerebral palsy, autism spectrum disorder (ASD), and acquired brain injury (ABI), where AAT promotes emotional stability and psychological well-being (Ávila-Álvarez et al., 2020; Guzmán et al., 2022).

Therapeutically, AAT increases engagement and satisfaction in treatment sessions, leading to higher attendance and a more positive perception of hospital stays. The presence of therapy animals creates a pleasant atmosphere that strengthens the therapeutic relationship and motivates patients to participate in therapy (Guzmán et al., 2022; López-Fernández et al., 2023). Behavioral improvements are evident, particularly in managing aggression and enhancing behavior in children with ASD and ABI, where AAT serves as a calming and distraction technique, reducing pre-operative anxiety and aiding in mental recovery (Yap et al., 2017). Socially, AAT enhances interaction and communication, especially in children with autism, by fostering mutual responsiveness, warmth, and relaxation during interactions with therapy animals, which improves social engagement with family and healthcare professionals (Guzmán et al., 2022; Nilsson et al., 2023). Overall, AAT is a versatile and effective intervention that significantly enhances the physical, emotional, psychological, therapeutic, behavioral, and social well-being of pediatric patients in various healthcare settings.

According to Ávila-Álvarez et al. (2020), this study underscored that the absence of consent from parents and guardians was a significant factor preventing children from participating in the AAT sessions. Thus, this finding underscores the need for careful consideration of individual pain thresholds and activity levels when implementing AAT in pediatric settings (Nilsson et al., 2019). The delicate condition of these children necessitates

Careful consideration to prevent any potential adverse effects that might arise from the therapy, given their heightened vulnerability during recovery (Yap et al., 2017).

Ávila-Álvarez et al. (2020) highlight the importance of screening for allergies prior to implementing AAT to ensure the safety and comfort of all participants. Nilsson et al. (2023) stated the importance of assessing each child's comfort with animals before initiating AAT. Thereby limiting the possible advantages of AAT for pediatric patients. Understanding these fears is crucial for tailoring therapy to ensure a safe and supportive environment for all children involved (Yap et al., 2017). Findings suggest the importance of managing and training therapy animals to minimize behaviors that could potentially cause distress or discomfort to patients (Nilsson et al., 2023; Trujillo et al., 2019). Nilsson et al. (2023) emphasized the need to consider individual preferences and emotional responses when planning and implementing therapy sessions. Nilsson et al. (2023) stress that while there are challenges to participation, AAT can also foster significant positive interactions and engagement when appropriately managed.

According to findings, there is a need for careful budget planning and resource allocation when considering the adoption of AAT in healthcare environments. These financial barriers must be overcome to implement AAT and make it available to patients who could benefit. Insufficient literacy, skills, and resources in AAT. These findings highlight the need for enhanced education and better resource allocation to support the effective implementation of AAT in healthcare settings (Yap et al., 2017).

Guzmán et al. (2022) declare findings underscore the importance of managing the number and roles of staff during therapy sessions. Further, an overcrowded or overly active environment might detract from the therapeutic benefits of AAT, while a more controlled and calm setting can enhance the overall experience for both patients and professionals.

6.2 Ethics

The practice of research ethics is essential to evidence generation, nursing education, and research. It is crucial to prepare for and foresee any hazards that may arise during research. To conduct studies, researchers need to familiarize themselves with research ethics and thoughtfully integrate ethical considerations into their work. Ethical principles are necessary for good ethical nursing research conduct (Doody and Noonan, 2016:

803). The following are the ethical guidelines: Researchers must obtain informed consent from participants and their guardians, ensuring they are fully aware of the study's objectives, methods, potential risks, and benefits. Participants' privacy and confidentiality must be always protected. Data anonymization and limiting access to authorised personnel are important considerations for researchers. Being both beneficent and non-maleficent means that researchers should put participants' needs first and make sure that the intervention's possible advantages outweigh any possible drawbacks. **Autonomy Respect:** Participants are free to leave the study at any moment and there won't be any consequences (Moule and Goodman. 2009: 56-58).

Globally, research ethics committees have emerged as the primary safeguards against potential dangers associated with research participation. In fulfilling their gatekeeping function, research ethics committees aim to ensure that researchers follow fundamental ethical standards set by the community and outlined in ethical guidelines, such as the Declaration of Helsinki, and professional research ethics codes, like the "Code of Human Research Ethics" of the British Psychological Society. Research ethics committees, or RECs, are responsible for ensuring that studies have a real chance of producing new knowledge or helping patients. They look to specialists for peer review since they frequently lack the knowledge necessary to make these decisions. Experienced nurses can offer important insights for nursing research. Since they have a unique knowledge base that can benefit the nursing profession, nurses should participate in RECs and serve as expert peer reviewers. But because of its scholarly or therapeutic background, this role is frequently underestimated (Gelling, Ersser, Heaslip, Trenoweth and Tait, 2021:69,70).

6.3 Validity

Research validity is the accuracy of a study's measurement of the study's concept, which is crucial in research methodology for ensuring the reliability and meaningfulness of its conclusions (Hayashi, Abib and Hoppen, 2019:100)

The types of validity are as follows: Internal validity pertains to the study's capacity to accurately measure its intended outcome while eliminating the influence of confounding variables. This entails reducing bias, controlling factors, and designing a robust research. **External Validity:** Applying the research results to a larger population than just

the study sample. Researchers must take in to account elements such as the representativeness of the sample and the results' generalizability. Ensuring that the study's metrics appropriately represent the underlying constructs under investigation—such as the efficacy of animal-assisted therapy—is known as construct validity. Reliability: guaranteeing outcomes' consistency and reproducibility. Consistent data collecting processes and dependable measuring instruments are important for researchers to employ (Burns and Grove. 2010: 102). Ecological Validity: Considering how the results might be used in the actual world. When it comes to animal-assisted treatment, researchers have to evaluate the intervention's viability and efficacy in paediatric care environments (Kamioka et al. 2014: 372).

6.4 Conclusions and utilization of the results and recommendations

Throughout this thesis we have reviewed numerous studies to pinpoint the notable effects of animal-assisted therapy and associated challenges in pediatric health care setting. Our findings conclude the integral benefits that can be expect after animal-assisted intervention and obstacles that can be confronted when delivering the therapy. These effects summarized as improving physical health, emotional and psychological benefits, therapeutic engagement, behavioral benefits and social benefits as well as legal and ethical issues, physiological barriers, unfamiliar animals and their behavior, health care treatment process, insufficient literacy, skills, resources, financial barriers, environmental issues are confronted challenges when conducting animal-assisted interventions.

Ultimately, after identifying these factors healthcare providers can be implemented such kind of worthwhile intervention in practical setting due to their vital results and overcome the risk factors to receive maximum outcome from the animal-assisted therapy. .

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Appendices

Appendix 1. Summary of Selected Articles.

Author(s), Year, Country	Topic/Title	Methodology & Methods	Participants	Main Outcomes
Ávila-Álvarez, De-Rosende-Celeiro, Jácome-Feijoo, Pardo-Vázquez and Torres-Tobío. 2020 Spain	Assessing the Outcomes of an Animal-Assisted Intervention in a Paediatric Day Hospital: Perceptions of Children and Parents	An intra-subject quasi-experimental longitudinal design was used for the purpose of examining the effects of participating in an AAI session conducted at a paediatric hospital unit	A total of 55 children in outpatient care at a paediatric day hospital. Children older than 2 and younger than 16 years of age having enough mental, physical and communication abilities to understand and follow the assessment procedures and the AAI session.	A significant improvement in the child's self-assessment of their emotional well-being. In parallel, the parents confirmed this significant improvement in the child's mood. conducting an animal-assisted session just before an outpatient medical procedure is an effective approach in the promotion of emotional welfare
Demiralay & Keser 2022 Turkey	The effect of pet therapy on the stress and social anxiety lev-	study was a single-blind randomized experimental study with a	study was carried out between November 2019 and September 2020 in two	After the pet therapy program intervention, it was found that there was a decrease in the mean Perceived Stress Scale (PSS) and

	els of disabled children: A randomized controlled trial	pre-test, post-test and follow-up design.	separate Special Education and Rehabilitation Centers with a total of 44 physically disabled children, 23 in the control and 21 in the intervention group	Social Anxiety in Children Scale-Revised Version (SACS-R) scores of the children in the intervention group, and this decrease was significant compared to the individuals in the control group. It was determined that the pet therapy program was an effective intervention in reducing the stress and social anxiety levels of the physically disabled children.
Guzmán, Rodríguez, Santamarina-Perez, Barros, Giralt, Elizalde, Ubach, Gonzalez, Yuste, Téllez, Cela, Laura Real Gisbert, Miquel Salmeron Medina, Anna Ballesteros-	The Benefits of Dog-Assisted Therapy as Complementary Treatment in a Children's Mental Health Day Hospital	Mixed methods research pre-post quantitative study. semi-structured interviews	23 children under 13 treated in a day hospital	A study found that Dog-Assisted Therapy (DAT) in a DH unit resulted in fewer emotional outbursts and improved attendance among children. While some improvement in self-control and social skills was observed, further investigation is needed to definitively link it to DAT.

Urpi and Astrid Morer Liñan 2022 Spain				
Lopez-Fernandez, Palacios-Cuesta, Rodriguez-Martinez, Olmedilla-Jodar, Fernandez-Andrade, Mediavilla-Fernandez, Sanchez-Diaz, And Maximo-Bo-canegra. 2023. Spain	Implementation feasibility of animal-assisted therapy in a pediatric intensive care unit: effectiveness on reduction of pain, fear, and anxiety	A prospective, quasi-experimental study, non-randomized study	Aged between 3 and 17 years old. In the pediatric intensive care unit of the Hospital Universitario 12 de Octubre of Madrid, from January 2019 to December 2019.	Physiological variables and the level of pain (visual analog scale or Wong-Baker scale), fear (Child Medical Fear Scale), and anxiety (modified Yale Preoperative Anxiety Scale) were evaluated before and after each session. Animal-assisted therapy is effective for the reduction of pain, fear, and anxiety, and therefore, it could be considered an adjunct to non-pharmacological therapy
Nilsson, Funkquist, Edner, Engval 2019 Sweden	Children report positive experiences of animal-assisted therapy in paediatric hospital care	mixed methods were used such as questionnaires with fixed and free response options in order to capture the	Fifty children in a paediatric surgery ward, at a tertiary hospital in Sweden, were included	The children's well-being increased from moderately good before to very good after animal-assisted therapy, and the children assessed the hospital stay as better after than

		children's experiences.	between February 2016 to May 2017	before. The vast majority of the children (93%) assessed the interaction with the dog as very good. The children described mixed experiences before and mainly positive aspects of joy, satisfaction and pain relief after animal-assisted therapy
Nilsson, Engvall, Enskär, Edner, Funkquist. 2023 Sweden	Children's interaction with a dog when having Animal Assisted Activity in paediatric hospital care	A cross-sectional study design. Data was collected by a participant semi-structured observation	Children (n = 49) aged 3–18 years of age at a paediatric hospital voluntarily participated in the study.	The results are reported on a six-level scale that describes the child-dog interaction: 1. Passive interaction, 2. One-way non-spoken communication, 3. Facilitating the interaction, 4. Interaction by activity encouragement, 5. Interaction initiated by the child, and 6. Interaction through deepened interplay. All children attained level five. Eighty-nine per cent attained level six and these children interacted fully, having a two-way deepened interplay with the dog. Further, when the interaction proceeded to a

				deepened interplay this affected the children positively both physically and emotionally.
Sarman, Günay. 2022. Turkey	The effects of goldfish on anxiety, fear, psychological and emotional well-being of hospitalized children: A randomized controlled study	an open-label, single-center randomized controlled experimental study	112 children aged 8 to 10 years old (56 in the study group and 56 in the control group and Women's Health Hospital in eastern of Turkey	In inter-group comparisons after the animal-assisted intervention, the state anxiety and fear levels of the children decreased, psychological and emotional well-being levels increased. After a while, it helped the children to see the hospital where they received inpatient treatment as a safe environment similar to the home environment they were used to.
Sarman, Tuncay. 2023 Turkey	Goldfish or aquatic turtle? Impact of two animal assisted interventions on children's pain, anxiety, and fear during IV	randomized controlled trial. It included two experimental groups (goldfish group and aquatic turtle group) and one control group. Furthermore,	98 children (control group=32, goldfish group=33, aquatic turtle group=33) aged 5–6 years, attending outpatient clinic for blood sampling and catheterisation	When analyzing the pain, anxiety, and fear findings, no statistical difference was found between the scores of the mother, child, and researcher before the procedure. During the catheterization procedure, the pain, anxiety, and fear scores of the children in the fish and turtle groups increased

	catheterization: A randomized controlled trial	three measurements were conducted before, during, and after the procedure. Wong Baker Facial Pain Scale, Child Anxiety Scale-State, and Child Fear Scale	Procedures.	statistically less than those in the control group. When analyzing the post-procedure findings, the pain, anxiety, and fear scores of the control group were similar to those before the procedure. In the fish and turtle groups, anxiety and fear scores were statistically the lowest
Trujillo, Kuo, Hull, Ingram, Thurstone 2019 USA	Engaging Adolescents: Animal Assisted Therapy for Adolescents with Psychiatric and Substance Use Disorders	an exploratory study with a quasi-experimental pre-post comparison group design.	Participants were 31 adolescents (ages 12–17 years) participating in an urban school-based substance treatment program. Cases (n = 14) received treatment with AAT, whereas comparison (n = 17) received treatment without AAT.	Participants who received treatment with AAT attended more therapy sessions within a 16-week period than those that received treatment without AAT. Additionally, the AAT group had a greater improvement in overall wellbeing than treatment group without AAT.

Uglow, L. S. 2019 UK	The benefits of an animal-assisted intervention service to patients and staff at a children's hospital	Two separate online surveys were conducted involving parents and staff.	Parents and staff of all eight paediatric wards including day, medical, surgical, oncology and intensive care at a UK children's university teaching hospital.	Children were distracted from their illness and were more relaxed, and that the ward was a happier place, the work environment was more interesting and that nurses accepted the dogs. After implementation staff were less concerned about the possibility of dog bites and dogs doing damage to equipment. The results presented in this article show overwhelmingly that the service is supported and considered to be of great benefit.
Yap, Scheinberg & Williams 2016 Australia	Attitudes to and beliefs about animal assisted therapy for children with disabilities	An online survey asking participants their opinions about the inclusion of AAT, and potential barriers to its introduction in a tertiary hospital setting was	A total of 128 participants responded to the survey request. Children with disabilities at the Royal Children's Hospital (RCH), focusing specifically on cerebral palsy (CP), autism spectrum	Almost all survey respondents reported that animal-assisted therapy would be helpful in the physical or behavioral management of children affected by CP (98%), ASD (99%) and ABI (96%), and 98% of survey respondents supported the inclusion of AAT in

		advertised on the RCH Intranet from 3 March 2015 to 3 April 2015.	disorder (ASD) and acquired brain injury (ABI).	the RCH. Ninety-two percent recommended AAT in the inpatient setting and 52% of the respondents suggest that it should be administered as a predetermined program with set activities.
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Appendix 2. Results of the content analysis (Research question 1)

Sub-category	Generic category	Main category
Improving well-being	Physical health	Effects of animal assisted therapy in pediatric care
Pain management		
Positive improvement of physical health		
Improvement in physical activeness.		
Improve comfort		
Good emotional support	Emotional and psychological benefits	
Enhanced mood		
Improving thought		
Improvement in confidence		
Reduce stress		
Reduction in anxiety		
Reduction in fear.		
Enhance emotional regulation and management.		

Higher attendance for the treatments.	Therapeutic engagement	
Willing to stay at hospital		
Improve therapeutic relationship.		
Support as a speech therapy		
Enhance positive behavioural response	Behavioural improvement	
Improvement in social interaction and communication	Social benefits	

Appendix 3. Results of the content analysis (Research question 2)

Sub- category	Generic category	Main category
No parental permission	Legal and ethical issues	Challenges of AAT
child unwilling to take part		
consider the child's delicate state	Physiological barriers	
exhausted from spending time with the dog.		
After engaging in additional activity with the dog, pain increases.		
allergen to animals	Participant Health and Safety	
Risk of infection.		

Posibility of infection.		
fear, anxiety, or discomfort in the animals.	Psychological barriers	
phobia of animals		
Give up pleading and sniffing.	Animal Behavior	
Dog would bite		
Schedule Conflicts	Barriers to Participation	
Specific Exclusion Condition		
Refusal to Participate		
Support for Interaction		
Inadequate training, lack of skills and knowledge		
unfamiliar		
Inadequate training	Insufficient literacy, skills, and resources in AAT	
had no prior experience with AAT.		
Unaware of its impact on the therapeutic process		
Inadequate knowledge		
Deficient resources		
Nobody had ever used AAT before.		
proposed obstacle is cost.	Financial issues	
overstaffing during the AAT	Environmental issue	
Hospitalization		

