

LITERATURE REVIEWS

The Benefits of Dog-Assisted Therapy for Children With Anxiety

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Background

Anxiety disorders are one of the most common mental health disorders experienced by children, and they have a negative effect on social, academic, and health functioning. While traditional psychotherapy has focused on methods such as cognitive behavioural therapy and parental anxiety management to treat these children, interest is growing in animal-assisted therapy (AAT) as a therapeutic modality, and recent research suggests the benefits of AAT within the realms of psychotherapy for children with anxiety.

Aim

This review aimed to perform a critical appraisal of the available literature relating to dog-assisted psychotherapy for children with anxiety and investigate the effectiveness of this therapy method in reducing anxiety.

Method

This structured literature review was guided by the 12 steps recommended by Kable et al. (2012). The search was conducted in August and September 2021 through the databases ScienceDirect, PsycInfo, and PubMed to locate published peer-reviewed literature on the therapeutic benefits of including a dog in psychotherapy sessions for children with anxiety. After critical appraisal, 10 articles were included in the review.

Results

General agreement exists that dog-assisted therapy can boost positive emotions and reduce anxiety levels in children, and that interacting with dogs and experiencing their unconditional acceptance help reduce children's stress and physical pain levels as well as stress in families. The key themes that emerged from this review included the human-animal bond, children's attachment styles, hospitalisation and environmental considerations, the AAT methods used, and the effects of AAT.

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Conclusion

This review revealed many benefits of the presence of a therapy dog during psychotherapy sessions, including reducing anxiety, increasing positive emotions, and enabling social interactions for children with anxiety. Counsellors and psychotherapists can feel confident to undertake the required training and implement the necessary systems to accommodate a therapy dog in their therapeutic setting in order to support children with anxiety. It is noteworthy that the positive effects of dog-assisted therapy were not consistent throughout the literature, and most research studies focused on children in hospital settings. Therefore, further research is required regarding the effectiveness and clinical implications of the nature, type of intervention, length, and duration of dog-assisted therapy.

Anxiety disorders are the most common mental health disorders experienced by children and are associated with significant negative outcomes, such as impaired academic, financial, social, and health functioning (Polanczyk et al., 2015). Half of all lifetime anxiety disorders emerge by 11 years of age, and the individuals affected are at increased risk of continued recurring anxiety and other mental health disorders later in life (Polanczyk et al., 2015; Reardon et al., 2018). Generalised anxiety disorders are defined as excessive anxiety and worry (apprehensive expectation), occurring more days than not, for at least six months surrounding a number of events. In relation to children, the anxiety is experienced as extremely challenging to control and is accompanied by at least one physical or cognitive symptom (American Psychiatric Association, 2013). Potential causes include biological, genetic, and environmental factors, as well as the parental attachment of the individual (Brown et al., 2013; Hopper, 2007; Karayağız et al., 2020).

Treatment options are available such as cognitive behavioural therapy, family-based cognitive behavioural therapy (Khanna & Kendall, 2009), treatment focused on parent–child interactions, and parental anxiety management (Cobham et al., 2010; Creswell et al., 2020). However, recent research has recognised that animals and animal-assisted therapy (AAT) can provide children with relief from anxiety symptoms as well as emotional stability in clinical and classroom settings (K. L. Anderson & Olson, 2006; Barker et al., 2015; Jones et al., 2018). Research has also shown that animals can provide socio-emotional support that can facilitate coping and resilience for children through the human–animal bond (Walsh, 2009). Pets in families offer comfort, affection, and a sense of security; therefore, these positive attributes may be transferable to a mental health clinical setting (Walsh, 2009). The therapist–client relationship may be threatening for a child, and it is possible that the presence of an animal may reduce the intensity of the therapist–client relationship and strengthen the emotional bond between the therapist and client through the sharing of the therapy animal, thereby facilitating a natural development of the therapeutic alliance (Parish-Plass, 2013).

There is growing interest in AAT in clinical practice with people who are suffering from mental health issues. For example, research has been conducted regarding AAT in the contexts of reducing anxiety levels in university students (D. Anderson & Brown, 2021) and older adults with psychiatric disorders (Berget et al., 2008; Koukourikos et al., 2019). Research has also shown the

effectiveness of AAT for children with developmental disabilities regarding social interaction and participation skills (Martin & Farnum, 2002; Solomon, 2010); however, limited research has been conducted regarding the effectiveness of dog-assisted psychotherapy in reducing anxiety in children. Therefore, the aim of this literature review was to conduct a systematic literature review of studies on dog-assisted psychotherapy for children with anxiety and, in particular, to investigate the effectiveness of the presence of a therapy dog during psychotherapy sessions with children with anxiety.

Purpose Statement

The purpose of this structured literature review was to conduct a critical appraisal of the available literature relating to dog-assisted psychotherapy for children with anxiety and to investigate the effectiveness of this therapy method in reducing anxiety. The information is summarised in this paper and used to present evidence that can assist facilitation of psychotherapy practice changes and inform future research.

Research Question

Does the presence of a dog in psychotherapy sessions reduce anxiety levels in children with anxiety?

Method

The structured literature review was guided by the 12 steps recommended by Kable et al. (2012).

Databases and Search Engines

The databases included in the search were ScienceDirect, PsycInfo, and PubMed. The search was conducted during August and September 2021 with the intent to locate published peer-reviewed literature on the therapeutic benefits of involving a dog in psychotherapy sessions for children with anxiety. Google Scholar was also searched to identify any additional grey literature relevant to the research topic. To increase the chances of identifying all relevant studies, the reference lists of the retrieved articles were hand searched for papers not yet identified.

Search Limits

The limits applied to the current search were English language articles that had been published from January 2010 to August 2021. The time limit was applied to reflect the most up-to-date research literature.

Inclusion and Exclusion Criteria

To be able to represent the target population, the search was narrowed by the introduction of inclusion criteria. For this review, the inclusion criteria included the following:

- articles whose participants included children up to the age of 18 years
- original research articles pertaining to dog-assisted therapy or the presence of a dog in psychotherapy sessions

- studies that had measured and reported anxiety levels in children.

Articles were excluded if they:

- were written in a language other than English
- focused on non-canine animals
- focused on participants over the age of 18 years (or adults)
- were previously published literature reviews, meta-analyses or systematic reviews, or opinion papers.

Search Terms

The search terms were developed from the research question, and alternative search terms were identified through an initial search via PubMed. The identified search terms were used to search Science Direct, PsycInfo, and PubMed focusing on the title, abstract, and body of the articles, and the Boolean operator AND was used to combine search terms, as follows:

- children with anxiety AND dog psychotherapy
- children with anxiety AND dog therapy AND animal-assisted therapy
- animal-assisted therapy for children with anxiety AND canine-assisted therapy for children with anxiety.

Search Process and Search Results

The databases were searched in sequential order. The combined search terms were used in the selected databases, and a manual search was conducted using Google Scholar search engine to identify any other relevant literature. Hand searching of the selected papers' reference lists resulted in the retrieval of an additional two papers. Titles and abstracts were screened after duplicates had been removed, and relevance was assessed against the pre-designed inclusion criteria for the review. Studies that met or could potentially meet the inclusion criteria were retrieved in full for critical appraisal. Initially, the search returned 876 articles, and after the screening process and duplicate removal, 10 articles remained. The search process and results are presented using a PRISMA flowchart (Moher et al., 2009; see [Figure 1](#)).

Of the 10 papers, seven used a quantitative methodology and three used a mixed methods approach. Six papers were published in the United States, one in Germany, one in Italy, one in Spain, and one in Sweden. The interventions typically consisted of the presence of a dog and some level of interaction of the dog with the children in either a structured or unstructured context.

Quality of Study

The Critical Appraisal Skills Programme (CASP) tool was used to assess the full text of each selected research article for its quality according to the criteria associated with the study design and methodology (CASP, 2018). The

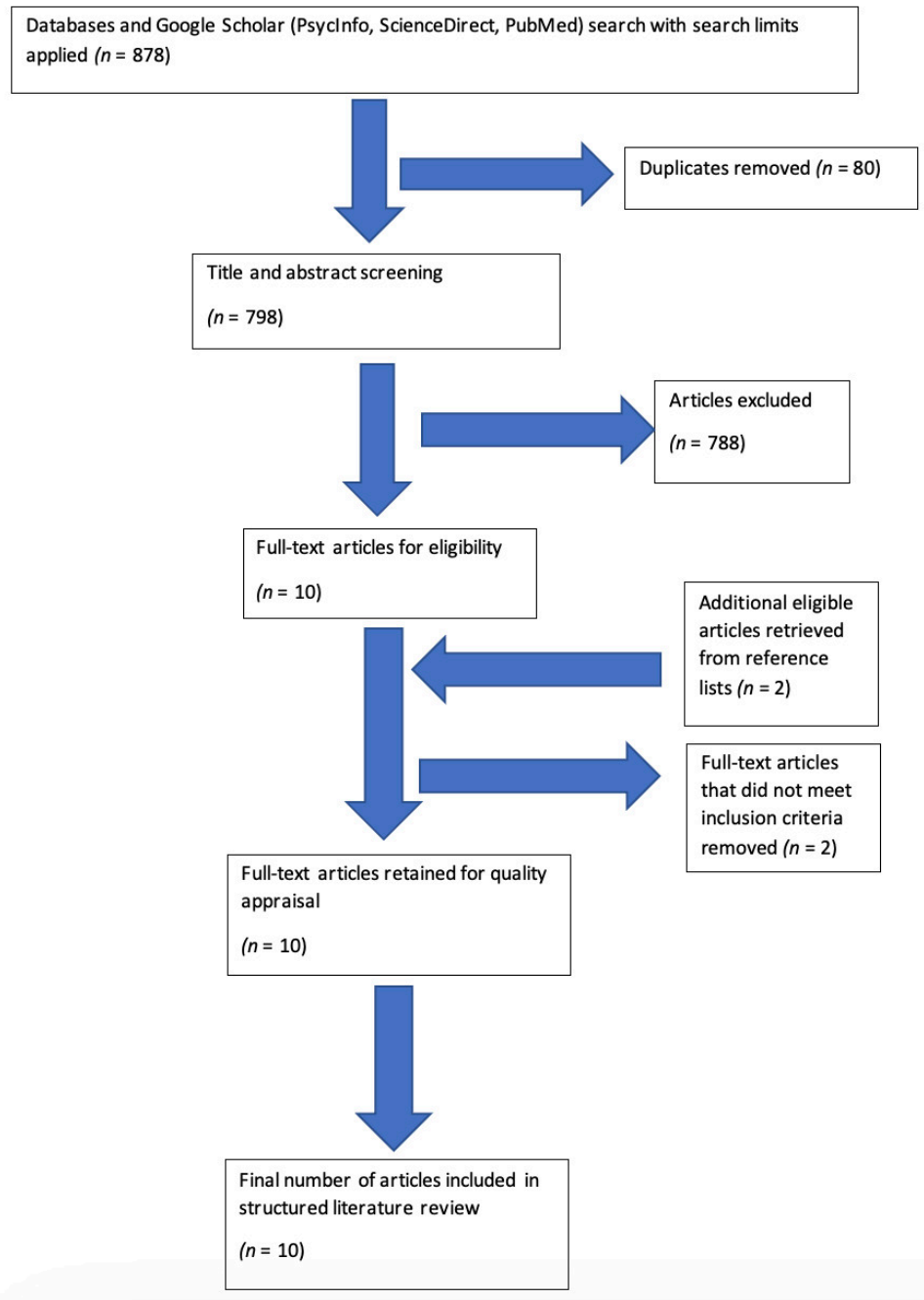


Figure 1. PRISMA Flowchart of Articles Screened

Note. Adapted from “Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement”, by D. Moher, A. Liberati, J. Tetzlaff, D. G. Altman, and The PRISMA Group, 2009, *PLOS Medicine*, 6(7), Article e1000097 (<https://doi.org/10.1371/journal.pmed.1000097>). Copyright 2009 by The PRISMA Group.

appropriate CASP checklist was used (i.e., randomised controlled trial, case control, and qualitative checklists) to assign a score (low, moderate, high) based on the criteria. The final number of articles included for this structured literature review was 10. Seven of these papers used a quantitative methodology and three used a mixed methods approach. The summary of articles is documented in [Table 1](#).

Table 1. Summary Table of Articles That Met the Inclusion Criteria

	Author (Year, country)	Aims of research	Research design	Data collection/analysis	Sample size and sites	Key findings/conclusions	Quality appraisal
1.	Dietz et al. (2012). United States of America (USA).	To compare the effectiveness of three group interventions on trauma symptoms for children where all three groups followed the same treatment protocol and two incorporated animal-assisted interventions.	Quantitative study.	Demographic and abuse-related characteristics were collected from the protective caregiver. Trauma symptoms were assessed using the Trauma Symptom Checklist for Children. A series of one-way ANOVAs (statistical formulas) were conducted to compare the changed scores from pre- to post-test for the three groups.	150 children aged 7 to 17 years in group therapy at a child advocacy centre in the USA.	Therapy dogs can offer unconditional acceptance, which can help children overcome their fears and insecurities. The scores for both the Dogs No Stories and Dogs With Stories groups decreased significantly from pre-test to post-test stages, and the scores for the Dogs With Stories group consistently decreased more than those for the Dogs No Stories group.	Moderate.
2.	McCullough et al. (2018). USA.	To examine the effects of an AAT on the stress, anxiety, and health-related quality of life for children diagnosed with cancer.	Quantitative randomised controlled trial with two groups: (a) standard care plus regular visits from a therapy dog, (b) standard care only. This examined the effects of an AAT on anxiety in children with cancer.	Data were collected at set points over 4 months of the child's treatment. Measures included the State-Trait Anxiety Inventory™, Pediatric Quality of Life Inventory, Pediatric Inventory for Parents, and child blood pressure and heart rate.	106 children aged 3 to 17 years at 5 paediatric hospitals in the USA.	Children in both groups experienced a significant reduction in state anxiety. Animal-assisted interventions may provide certain benefits for parents and families during the initial stages of paediatric cancer treatment.	High.
3.	Barker et al. (2015). USA.	To investigate the effect of a 10-minute AAT on anxiety and pain in paediatric patients.	Mixed qualitative and quantitative pre- and post-test research reflecting ratings of anxiety with two groups: (a) animal-assisted	A research assistant administered family questionnaires, and pain and anxiety scales immediately before and after the assigned condition.	40 children aged 8 to 17 years. A children's hospital.	A significant post-condition difference was found between groups regarding anxiety: the AAT group had lower anxiety scores. However, no significant changes between pre-post groups were detected.	Moderate.

Author (Year, country)	Aims of research	Research design	Data collection/analysis	Sample size and sites	Key findings/conclusions	Quality appraisal
		intervention, (b) jigsaw puzzle work.				
4. Beetz et al. (2012). Germany, Switzerland, and Austria.	To investigate whether children with insecure-avoidant/disorganised attachment can profit more from social support by a dog compared with a human during a stressful task.	Quantitative study measuring salivary cortisol levels.	Data were collected on 2 different days, 1 week apart. On day 1, a questionnaire on the children's pet ownership and attachment to their own pets and the Separation Anxiety Test were administered. The entire test on day 2 was videotaped and coded for behaviours of the child and their interaction with the social supporter and experimenter.	47 male children identified as having insecure-avoidant or disorganised attachment between the ages of 7 and 11 years. Several schools in Germany and Austria.	Male children with insecure-avoidant or disorganised attachment profit more from the presence of a therapy dog than the presence of a friendly human under social stress. Dogs can be helpful in assisting education since stress interferes with learning and performance.	Moderate.
5. Hartwig (2017). USA.	To investigate the human-animal resilience therapy (HART) intervention and understand whether the HART intervention significantly reduces anxiety, depression, anger, and disruptive behaviour in both treatment and comparison conditions.	Quantitative research.	The children met with their counsellor/therapy dog team on a weekly basis for 10 individual sessions, and at the final session, the children completed the Beck Youth Inventories-II as a post-test.	29 children aged 10–18 years presenting with emotional issues such as anxiety and grief. Community counselling clinic at a university in Texas.	Paired samples <i>t</i> -test analyses showed statistically significant differences between pre-test and post-test scores for anxiety inventories for both treatment and comparison groups.	High.
6. Branson et al. (2017). USA.	To assess the effectiveness of animal-assisted activities (AAA) on stress responses (anxiety) in	A quantitative, two-arm, randomised controlled design.	The AAA intervention consisted of a one-time 10-minute AAA with a dog and handler who interacted with the child, while the control group was given a new plush stuffed dog for the same 10-minute time frame; no structured activity was given for either	53 children were recruited from a medical-surgical unit in an urban teaching hospital in the USA.	Positive affect and decreases in negative affect were larger in the intervention condition (AAA); however, pre- and post-intervention differences between the intervention and control groups were not significant. Pre- and post-intervention	High.

	Author (Year, country)	Aims of research	Research design	Data collection/analysis	Sample size and sites	Key findings/conclusions	Quality appraisal
		hospitalised children.		group. The State Trait Anxiety Inventory for Children (STAI-C) was used as well as the 10-item Positive and Negative Affect Schedule for Children, the Pet Attitude Scale, the Human–Animal Interactional Scale, and salivary cortisol testing.		differences between the conditions in salivary cortisol and C-reactive protein (CRP) were not statistically significant. Baseline levels of anxiety, cortisol, and CRP had a significant correlation to the corresponding post-intervention measures.	
7.	Crossman et al. (2020). USA.	To evaluate the effects of brief, unstructured interactions with unfamiliar dogs on children's anxiety, affect, and physiological arousal following exposure to a stressful task.	A quantitative controlled study.	The children completed the Trier Social Stress Test for Children, which was followed by interaction with a dog, or a tactile stimulation control condition, or a waiting control condition. The Positive and Negative Affect Schedule for Children, Short Form, and the STAI-C were completed at baseline and post-test stages. Salivary cortisol was assessed at 5 time points.	78 children aged 10–13 years from the local community surrounding a university in the USA.	Brief, unstructured interactions with dogs boosted children's positive emotions and reduced anxiety. No effect was detected on physiological arousal. Additional research is needed to establish whether the benefits of interactions with animals exceed the effects of other common strategies for alleviating stress.	High.
8.	Vidal et al. (2020). Spain.	To evaluate the efficacy of dog-assisted therapy (DAT) combined with pharmacological treatment in children with foetal alcohol spectrum disorder (FASD).	A quantitative, randomised, rater-blinded controlled study.	Pre-test and post-test measures were completed a week before and after the 12-week intervention. The Child Behaviour Checklist, Social Skills Improvement System–Parent Form, and Clinical Global Impression Scale for Severity were completed by the parents.	33 children with FASD between the ages of 6 and 18 years. University hospital in Barcelona, Spain.	No significant differences were obtained in internalising symptoms (anxiety and depression). DAT is a promising adjunctive treatment for children with FASD.	High.
9.	Lindström Nilsson et al. (2020). Sweden.	To evaluate children's responses to AAT using a therapy dog as complementary treatment in hospital care.	Mixed methods.	Children answered fixed and free response questions about their feelings of wellbeing, experiences of the hospital stay before and after AAT, and experiences of interactions with a therapy dog.	50 children aged 3 to 18 years on a surgery ward in a tertiary hospital in Sweden participated and answered questions about feelings of wellbeing before and after AAT. Statistical	The children mentioned negative thoughts such as fear about procedures and sadness over their illness. DAT plays an essential role in decreasing fear or anxiety for children. The children reported feeling more relaxed and not thinking so much about their pain when they had received AAT.	High.

Author (Year, country)	Aims of research	Research design	Data collection/analysis	Sample size and sites	Key findings/conclusions	Quality appraisal
10. Stefanini et al. (2015). Italy.	To compare the effects of AAT with a standard treatment protocol in children and adolescents admitted to a psychiatric hospital for acute mental disorders.	A pre-post-experimental design with a randomised controlled trial.	The AAT intervention structured sessions lasted for 3 months, and the 45-minute weekly sessions were videotaped. The instruments used included the Children's Global Assessment Scale. Video evaluation of AAT was coded by two independent investigators.	Package for the Social Sciences (SPSS) was used for the statistical analyses of the quantitative data. 34 children aged 11 to 17 years (placed in either the AAT or control group) with a mood disorder, schizophrenia, eating disorder or anxiety disorder. Meyer Paediatric Hospital (University of Florence in Italy).	Results indicated a statistically significant improvement in global functioning in children and verified that AAT can have significant positive effects on therapeutic progress and the recovery process.	High.

Results

General agreement exists in the literature that AAT can boost positive emotions and reduce anxiety levels in children. The interaction with the dogs and the unconditional acceptance received from them help reduce children's stress and physical pain levels, as well as the stress in families and parents (Beetz et al., 2012; Branson et al., 2017; Dietz et al., 2012; Lindström Nilsson et al., 2020; McCullough et al., 2018; Stefanini et al., 2015).

Human–Animal Interactions

Animals have historically been well known for providing human companionship, being part of a therapeutic process, and having a positive impact on humans (Koukourikos et al., 2019; Walsh, 2009). Therapy dogs have been used effectively with children in hospitals and care facilities to assist with a range of disorders, abuse, oppositional behaviour, and pain management (Barker et al., 2015; Dietz et al., 2012). Children who participated in AAT were found to be more attentive, open, and alert when therapy dogs were present (Dietz et al., 2012). The human being's relationship with animals in therapeutic interventions can provide improvements in mood, stress or anxiety, emotional stability, socialisation, and physical health factors (McCullough et al., 2018). Thus, interactions with dogs in close proximity (tactile and visual stimulation) have boosted children's positive emotions and reduced their anxiety (Branson et al., 2017; Crossman et al., 2020).

Children's Attachment Styles

Attachment issues have been linked with causes of anxiety in children (Hopper, 2007; Karayağız et al., 2020). Children with insecure-avoidant attachment have experienced their primary caregiver as rejecting or unsupportive; therefore, they may experience difficulties or exhibit avoidant tendencies when relating to animals, especially when stressed. Male children with insecure-avoidant or disorganised attachment benefited more from the stress-alleviating effects of interacting with a therapy dog than from interacting with a friendly adult (Beetz et al., 2012; Dietz et al., 2012). Studies also found that children with a secure attachment may benefit more from therapy dogs (Barker et al., 2015).

Hospitalisation and Environmental Considerations

Hospitalisation can be distressing to children in the context of separation from parents, painful procedures, and limited activity. The perception of pain can also be heightened by anxiety (Barker et al., 2015). Children admitted to hospitals often feel burdened, and they experience significant anxiety and negative emotions related to serious health problems and the unfamiliar environment, which negatively affect their immune function and recovery (Branson et al., 2017; McCullough et al., 2018). However, studies found that when children aged 3–18 years were admitted to hospitals, their anxiety levels were decreased by play activities that included interaction with a therapy dog

(Lindström Nilsson et al., 2020; McCullough et al., 2018), and these children described positive and bright memories of their interactions with the therapy dog (Lindström Nilsson et al., 2020).

Animal-Assisted Therapy Methods and Effects

Studies that utilised AAT intervention in structured sessions with individual therapeutic goals over a 3-month period found significant positive effects on the therapeutic progress (Stefanini et al., 2015; Vidal et al., 2020). Human–animal resilience therapy (HART) combines solution-focused and canine-assisted therapies to help children with their emotional, social, and behavioural issues. A study revealed a significant difference between pre- and post-intervention stages, indicating that the HART intervention decreased anxiety, depression, and disruptive behaviours (Hartwig, 2017). A mixed methods approach study found that children reported feeling more relaxed and thinking less about their pain after they had received AAT (Lindström Nilsson et al., 2020). The AAT included a calm period, an active period involving dog tricks, followed by a period of relaxation, and each child received a stuffed toy resembling their therapy dog; the result was that the children’s fear and anxiety decreased (Lindström Nilsson et al., 2020). Children with a history of sexual abuse showed significant decreases in trauma symptoms, including anxiety, after receiving AAT (Dietz et al., 2012). However, the positive effects of AAT are not consistent. Branson et al. (2017) investigated the effects of a 10-minute interaction in which the dog was at the child’s bedside within easy reach and found that children did not demonstrate significantly larger decreases in anxiety when compared with children in the non-AAT control group.

Discussion

This literature review revealed that the presence of a therapy dog in therapy sessions or AAT created a safe environment of trust and acceptance and could reduce anxiety levels in children and adolescents (Crossman et al., 2020; Daltry, 2020). Children became more open when therapy dogs were present because they felt warmth, security, and acceptance, and they experienced a reduction in psychological distress, all of which are conditions conducive to reducing anxiety (Dietz et al., 2012; Jones et al., 2019). However, the positive effects of AAT on anxiety were inconsistent. Hartwig (2017), who used both AAT and solution-focused therapy, found that children’s levels of anxiety decreased regardless of the presence of a dog because the effects of the standalone solution-focused therapy proved sufficiently beneficial. This study was limited by a small sample size ($n = 29$), and differing results may arise from a larger sample size. While many cognitive and kinaesthetic activities—for example, involving a sand tray or art materials—were described in the study, no detailed specifications were provided about the type of support that the therapy dog provided. This may indicate a lack of involvement or structure for the dog’s role in the intervention.

Although AAT has been found effective at reducing anxiety levels among hospitalised children, caution should be taken when generalising these results to the wider population of children. Many challenging factors were involved with a hospital admission, such as being physically unwell, parental stress, physical discomfort levels in a foreign environment, medications taken that potentially alter mood and pain levels, and the timing of the medication taken (e.g., medication taken post-AAT). These factors may influence the psychological state of the child, and the positive effects of AAT may be heightened owing to the heightened state of anxiety. Childhood psychiatric disorders such as generalised anxiety disorder were not mentioned in Shotwell and Wagner's (2019) study to evaluate the inclusion of animals in treatment. Autism spectrum disorders, trauma-related symptoms, and attention deficit hyperactivity disorder in children, however, were evaluated, and evidence was found to support clinicians considering the inclusion of animal-based interventions (Shotwell & Wagner, 2019).

More specific research is required to investigate AAT in different settings (e.g., classroom or outpatient therapy settings) in order to eliminate factors that may contribute to results from a hospitalised sample of children. Several studies investigated AAT's effect on negative emotional statements, finding mostly significant decreases in anxiety after AAT in both the experimental and control groups (Holder et al., 2020). However, in another longitudinal study by McCullough et al. (2018) following the progression of paediatric oncology treatment, no significant difference was found in negative emotion between the control and the experimental group which surprised McCullough and her colleagues. Many participants in AAT studies expressed their gratitude for the intervention through non-quantitative methods such as responding to interview questions with commentary, and therefore perceived effectiveness and satisfaction is the most robustly supported result in AAT oncology studies (Holder et al., 2020). Attachment to primary caregivers demonstrated a role in the child's relationship with a therapy dog; however, research has provided contrasting conclusions about whether children with avoidant or secure attachments benefit more from AAT (Dietz et al., 2012). It is unclear whether a linear correlation exists between attachment style and the benefits of AAT in children, so further research in this area is required to investigate the relationship and other factors involved. This information would be helpful for professionals to determine any detrimental and threatening aspects of AAT, the most suitable candidates for AAT, and the most effective way to approach AAT.

In accordance with Holder et al.'s study (2020) in which the effect of AAT on oncology patients was examined, the length of AAT or the duration of time spent with a therapy dog varied throughout the literature. These inconsistent amounts, which varied from 10 minutes to 50 minutes, may have influenced the positive outcomes of AAT. Although participants who received 10-minute AAT sessions experienced increases in their positive affect, their pre- and post-AAT differences in salivary cortisol were not significant (Branson et al., 2017).

This may have been a result of brief therapy, the structure or content of the interactions, or participants' low levels of baseline anxiety and normal levels of cortisol at the outset. Despite this, participants who received 15 minutes of AAT experienced a significant increase in positive emotions and a reduction in anxiety when compared with a control group (Crossman et al., 2020). The large degree of variation in duration and intervention method may influence the effects of AAT on children. More research is required to determine whether a particular dosage is most effective for children receiving AAT. In addition, studies varied in terms of the type of interaction (e.g., direct therapy dog interaction or guided attention towards the dog versus unstructured dog interactions), indicating potential barriers and gaps for measuring positive outcomes.

The literature has also neglected to control for factors contributing to stress relief consistently, such as family members being present, undivided attention with a caring adult, and professional and medication effects (Branson et al., 2017; Crossman et al., 2020). The studies varied in their participant selection for the baseline anxiety levels, and it was not specified whether children were diagnosed with anxiety or had undergone previous therapy for anxiety. Children who had received any other intervention method for anxiety before receiving AAT may have developed strategies for coping with anxiety and be more familiar with therapy approaches. Research conducted with children with a DSM-V diagnosis of anxiety may provide further knowledge on the effects and benefits of AAT.

Based on the research studies reviewed, a multitude of positive effects result from the presence of a therapy dog in therapeutic sessions with children. In addition to improving a child's attentiveness and mood, when children with anxiety are misunderstood by adults or their peers, a therapy dog can provide reassurance, a sense of safety, and additional emotional support. It can be inferred that a combination approach may be most helpful in supporting children with anxiety, including both the traditional methods as well as AAT. Therefore, psychotherapists and counsellors who are interested in including a therapy dog in a therapeutic setting should feel optimistic about exploring their options, including dog therapy training to accommodate this modality, in order to provide the best support to children with anxiety. Regular clinical review with an experienced supervisor is recommended as well as ongoing monitoring of the child's needs and therapy goals.

Conclusion

This literature review demonstrates the positive effects of the presence of a therapy dog during psychotherapy sessions for children with anxiety. The benefits include reducing anxiety levels, increasing the level of comfort or openness, and increasing positive emotions and social interaction in children with anxiety. Because of the many benefits of the presence of a dog in therapy sessions, psychotherapists and counsellors can be confident to undertake the required training and implement the necessary systems to accommodate a therapy dog in a psychotherapy or counselling session. The therapeutic setting

and the child's needs will vary, and therefore the individual therapist will need to make judgements regarding the nature of the session and whether the sessions should include active and direct contact or more indirect contact with the therapy dog.

Limited research has been conducted on children in settings other than hospital settings; therefore, it is challenging to understand and assess the effectiveness of AAT in other contexts, such as therapy, home, or school settings. While strong evidence exists to support the benefits of AAT, more research is required regarding the clinical implications of the nature of the AAT, type of AAT intervention, and length of AAT.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, D., & Brown, S. (2021). The effect of animal-assisted therapy on nursing student anxiety: A randomized control study. *Nurse Education in Practice*, 52, 103042. <https://doi.org/10.1016/j.nepr.2021.103042>
- Anderson, K. L., & Olson, M. R. (2006). The value of a dog in a classroom of children with severe emotional disorders. *Anthrozoös*, 19(1), 35–49. <https://doi.org/10.2752/089279306785593919>
- Barker, S. B., Knisely, J. S., Schubert, C. M., Green, J. D., & Ameringer, S. (2015). The effect of an animal-assisted intervention on anxiety and pain in hospitalized children. *Anthrozoös*, 28(1), 101–112. <https://doi.org/10.2752/089279315x14129350722091>
- Beetz, A., Julius, H., Turner, D., & Kotrschal, K. (2012). Effects of social support by a dog on stress modulation in male children with insecure attachment. *Frontiers in Psychology*, 3, 352. <https://doi.org/10.3389/fpsyg.2012.00352>
- Berget, B., Ekeberg, Ø., & Braastad, B. O. (2008). Animal-assisted therapy with farm animals for persons with psychiatric disorders: Effects on self-efficacy, coping ability and quality of life, a randomized controlled trial. *Clinical Practice and Epidemiology in Mental Health*, 4(1), 9. <https://doi.org/10.1186/1745-0179-4-9>
- Branson, S. M., Boss, L., Padhye, N. S., Trötscher, T., & Ward, A. (2017). Effects of animal-assisted activities on biobehavioral stress responses in hospitalized children: A randomized controlled study. *Journal of Pediatric Nursing*, 36, 84–91. <https://doi.org/10.1016/j.pedn.2017.05.006>
- Brown, H. M., McAdams, T. A., Lester, K. J., Goodman, R., Clark, D. M., & Eley, T. C. (2013). Attentional threat avoidance and familial risk are independently associated with childhood anxiety disorders. *Journal of Child Psychology and Psychiatry*, 54(6), 678–685. <https://doi.org/10.1111/jcpp.12024>
- Cobham, V. E., Dadds, M. R., Spence, S. H., & McDermott, B. (2010). Parental anxiety in the treatment of childhood anxiety: A different story three years later. *Journal of Clinical Child & Adolescent Psychology*, 39(3), 410–420. <https://doi.org/10.1080/15374411003691719>
- Creswell, C., Violato, M., Cruddace, S., Gerry, S., Murray, L., Shafran, R., Stein, A., Willetts, L., McIntosh, E., & Cooper, P. J. (2020). A randomised controlled trial of treatments of childhood anxiety disorder in the context of maternal anxiety disorder: Clinical and cost-effectiveness outcomes. *Journal of Child Psychology and Psychiatry*, 61(1), 62–76. <https://doi.org/10.1111/jcpp.13089>
- Crossman, M. K., Kazdin, A. E., Matijczak, A., Kitt, E. R., & Santos, L. R. (2020). The influence of interactions with dogs on affect, anxiety, and arousal in children. *Journal of Clinical Child & Adolescent Psychology*, 49(4), 535–548. <https://doi.org/10.1080/15374416.2018.1520119>
- Daltry, R. M. (2020). Embedded therapy dog: Bringing a therapy dog into your counseling center. *Journal of College Student Psychotherapy*, 34(2), 118–124. <https://doi.org/10.1080/87568225.2018.1544841>
- Dietz, T. J., Davis, D., & Pennings, J. (2012). Evaluating animal-assisted therapy in group treatment for child sexual abuse. *Journal of Child Sexual Abuse*, 21(6), 665–683. <https://doi.org/10.1080/10538712.2012.726700>
- Hartwig, E. K. (2017). Building solutions in youth: Evaluation of the human–animal resilience therapy intervention. *Journal of Creativity in Mental Health*, 12(4), 468–481. <https://doi.org/10.1080/15401383.2017.1283281>

- Holder, T. R. N., Gruen, M. E., Roberts, D. L., Somers, T., & Bozkurt, A. (2020). A systematic literature review of animal-assisted interventions in oncology (part I): Methods and results. *Integrative Cancer Therapies, 19*. <https://doi.org/10.1177/1534735420943278>
- Hopper, L. (2007). *Counselling and psychotherapy with children and adolescents*. Palgrave Macmillan. <https://doi.org/10.1007/978-1-137-05550-7>
- Jones, M. G., Rice, S. M., & Cotton, S. M. (2018). Who let the dogs out? Therapy dogs in clinical practice. *Australasian Psychiatry, 26*(2), 196–199. <https://doi.org/10.1177/1039856217749056>
- Jones, M. G., Rice, S. M., & Cotton, S. M. (2019). Incorporating animal-assisted therapy in mental health treatments for adolescents: A systematic review of canine assisted psychotherapy. *PLOS ONE, 14*(1), e0210761. <https://doi.org/10.1371/journal.pone.0210761>
- Kable, A. K., Pich, J., & Maslin-Prothero, S. E. (2012). A structured approach to documenting a search strategy for publication: a 12 step guideline for authors. *Nurse Education Today, 32*(8), 878–886. <https://doi.org/10.1016/j.nedt.2012.02.022>
- Karayağız, Ş., Aktan, T., & Karayağız, L. Z. (2020). Parental attachment patterns in mothers of children with anxiety disorder. *Children, 7*(5), 46. <https://doi.org/10.3390/children7050046>
- Khanna, M. S., & Kendall, P. C. (2009). Exploring the role of parent training in the treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology, 77*(5), 981–986. <https://doi.org/10.1037/a0016920>
- Koukourikos, K., Georgopoulou, A., Kourkouta, L., & Tsaloglidou, A. (2019). Benefits of animal assisted therapy in mental health. *International Journal of Caring Sciences, 12*(3), 1898–1905.
- Lindström Nilsson, M., Funkquist, E.-L., Edner, A., & Engvall, G. (2020). Children report positive experiences of animal-assisted therapy in paediatric hospital care. *Acta Paediatrica, 109*(5), 1049–1056. <https://doi.org/10.1111/apa.15047>
- Martin, F., & Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research, 24*(6), 657–670. <https://doi.org/10.1177/019394502320555403>
- McCullough, A., Ruehrdanz, A., Jenkins, M. A., Gilmer, M. J., Olson, J., Pawar, A., Holley, L., Sierra-Rivera, S., Linder, D. E., Pichette, D., Grossman, N. J., Hellman, C., Guérin, N. A., & O’Haire, M. E. (2018). Measuring the effects of an animal-assisted intervention for pediatric oncology patients and their parents: A multisite randomized controlled trial. *Journal of Pediatric Oncology Nursing, 35*(3), 159–177. <https://doi.org/10.1177/1043454217748586>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Medicine, 6*(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Parish-Plass, N. (Ed.). (2013). *Animal-assisted psychotherapy: Theory, issues, and practice*. Purdue University Press. <https://doi.org/10.2307/j.ctt6wq5c3>
- Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., & Rohde, L. A. (2015). Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry, 56*(3), 345–365. <https://doi.org/10.1111/jcpp.12381>
- Reardon, T., Spence, S. H., Hesse, J., Shakir, A., & Creswell, C. (2018). Identifying children with anxiety disorders using brief versions of the Spence Children’s Anxiety Scale for children, parents, and teachers. *Psychological Assessment, 30*(10), 1342–1355. <https://doi.org/10.1037/pas0000570>
- Shotwell, J. S., & Wagner, K. D. (2019). Animal-assisted interventions for treatment of childhood psychiatric disorders. *Psychiatric Annals, 49*(4), 173–181. <https://doi.org/10.3928/00485713-20190306-01>

- Solomon, O. (2010). What a dog can do: Children with autism and therapy dogs in social interaction. *Ethos*, 38(1), 143–166. <https://doi.org/10.1111/j.1548-1352.2010.01085.x>
- Stefanini, M. C., Martino, A., Allori, P., Galeotti, F., & Tani, F. (2015). The use of animal-assisted therapy in adolescents with acute mental disorders: A randomized controlled study. *Complementary Therapies in Clinical Practice*, 21(1), 42–46. <https://doi.org/10.1016/j.ctcp.2015.01.001>
- Vidal, R., Vidal, L., Ristol, F., Domènec, E., Segú, M., Vico, C., Gomez-Barros, N., & Ramos-Quiroga, J. A. (2020). Dog-assisted therapy for children and adolescents with fetal alcohol spectrum disorders: A randomized controlled pilot study. *Frontiers in Psychology*, 11, 1080. <https://doi.org/10.3389/fpsyg.2020.01080>
- Walsh, F. (2009). Human-animal bonds II: The role of pets in family systems and family therapy. *Family Process*, 48(4), 481–499. <https://doi.org/10.1111/j.1545-5300.2009.01297.x>