



# An Evaluation of Animal-Assisted Therapy for Autism Spectrum Disorders: Therapist and Parent Perspectives

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**Abstract** Although there are a variety of psychological and therapeutic approaches to coping Autism Spectrum Disorder, people with autism still face some challenges in a “normal” therapy setting. Some therapy organizations and services have proposed an alternative therapy approach, Animal-assisted therapy (AAT). The aim of this phenomenological study was to gain a better understanding of the therapists and parents of individuals who choose the alternative approach, AAT. Data were collected through structured interviews with a group of three therapists and four parents. An analysis of the data revealed three main themes; the first theme named the perceived benefits of AAT with three subthemes consisting of physical benefits, sensory benefits and emotional benefits. The second theme is named the way AAT works with subthemes of client-centred therapy and mixed models, and the third theme is potential limitations of AAT. Limitations and suggestions for future research are discussed.

**Keywords** Animal-assisted therapy · Autism · Lived experiences · Parents · Therapists

## Introduction

Autism Spectrum Disorder (ASD), more commonly known as autism, is an umbrella term for individuals who have difficulty in communicating and socializing with others and exhibit repetitive and restrictive patterns (American Psychiatric Association [APA], 2013). Although they may experience different symptoms, depending on severity, they often show a lack of speech, limited eye contact, prefer to be alone, have difficulty reading others’ emotions, repeat words or phrases, flail their arms, rock their body, have restricted interests, are resistant to environmental changes or changes in daily routine, and have unusually delicate sensory systems (de Schipper et al., 2016).

In addition to clinical symptoms, many people diagnosed with ASD also have a number of comorbid conditions such as anxiety, attention deficit disorder (Factor et al., 2017); and depression (Juraszek et al., 2019). Other comorbid disorders may include epilepsy, sleep disorders, sensory processing disorder, obsessive–compulsive disorder, and eating disorder (APA, 2013). Studies have found that on average, 60%–70% of individuals diagnosed with ASD also have a learning disability (Emerson & Baines, 2010).

Around the world, approximately 250 babies are born every minute; this equates to more than 130 million babies in a year. Among these 130 million newborns, 1 in 160 children are diagnosed with ASD. It is estimated that approximately 67 million people worldwide are affected by ASD (Mazurek et al., 2020). ASD is identified as a lifelong neurodevelopmental condition with unknown cause (de Schipper et al., 2016). It was originally thought to be the result of socialization with and around “refrigerator mothers” (Douglas, 2014). Autism was believed to be the result of cold mothers who did not show affection or

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love to their children. However, this notion was soon rejected as neuropsychological research progressed (Schmidt, 2019). Autism has also been falsely linked to vaccinations in the past; a claim that was not only based on falsified science, but also resulted in serious public health consequences (Flaherty, 2011).

Another explanation for ASD was offered by Baron-Cohen (2002), a theory referred to as the “extreme male brain theory.” Baron-Cohen (2002) proposed that the brains of women and men are different. While women’s brains work to read the emotions of others and are more likely to empathize with social cues, known as socializing behaviours, men’s brains work to recognize patterns, also known as systemizing behaviours. Patients with autism (both male and female) are thought to see the world through an extremely male brain. However, the questionnaire used to test the theory is said to have been developed based on gender stereotypes and sex differences, so its applicability is still open to speculation.

It is now widely accepted that ASD is the result of differences in brain function and structure. Using magnetic resonance imaging (MRI), research examining brains between individuals with and without ASD has found that individuals with ASD have abnormalities in grey and white matter in some regions of the brain, including the amygdala, cerebellum, and many other regions (Williams & Minshew, 2007). Studies state that ASD is likely a neural system condition, meaning that symptoms are caused by abnormalities in regionally distributed cortical networks rather than individual brain regions (Ha et al., 2015).

### Animal-Assisted Therapy for ASD

For several decades, various therapeutic modalities such as music therapy, play therapy, occupational therapy, speech therapy, and art therapy have been proposed to help people with ASD (Waterhouse, 2013). AAT has also been suggested as an alternative approach for individuals diagnosed with ASD (Altschiller, 2011; Braun et al., 2009). According to Chandler (2017), AAT refers to psychotherapy that incorporates animals as part of a formal therapeutic process. In therapy, the animal serves as a co-therapist to promote the quality and strength of the collaborative relationship between client and therapist. As soon as the client establishes a bond with the animal, the client automatically trusts their therapist as an authority figure. Trust and security allows the client to open up more quickly and benefit from therapy to a greater degree. AAT is not a one-time event, but it is a structured, goal-oriented type of psychotherapy that usually takes place over a number of sessions. Over the course of the therapy sessions, the client’s progress towards the goal set is measured and recorded (Altschiller, 2011; Kruger & Serpell, 2010).

It is well-documented that developing a relationship with animals brings untold benefits to humans (Bert et al., 2016; Chitic et al., 2012; Koukourikos et al., 2019; VanFleet & Faa-Thompson, 2014). Individuals who perceived pets as warm, compassionate, and caring were less stressed under conditions of chronic psychological pressure (Chandler, 2017). These changes have been shown to elevate overall levels of comfort and trust and decrease the body’s stress-related responses. By using the animal as a gateway to building a relationship with the client, therapists may find it easy to relate to client effectively and motivate clients’ commitment to the process of therapy (Braun et al., 2009). Science shows that AAT can have immense health benefits, such as recovery from health problems or management of certain medical conditions (Enders-Slegers et al., 2019). It has also been proven that AAT can improve fine motor skills and strengthen a person’s core stability and body coordination. Spending time with animals helps improve a person’s emotional state and wellbeing (Çakıcı & Kök, 2020). AAT can also significantly promote positive social behaviours such as sharing, cooperation, and volunteering (Çakıcı & Kök, 2020; Emerson & Baines, 2010; Kruger & Serpell, 2010).

The use of animals in therapy can be traced back to the last century. Freud, the founder of psychoanalysis, was one of the first therapists to introduce his pet dog into therapy sessions. During the session, he found that patients were more willing to communicate because of the presence of his pet (VanFleet & Faa-Thompson, 2014). In the 1940s, a group of war veterans suffering from PTSD were exposed to a farm environment with the animals. The results showed that their PTSD symptoms decreased with the animals’ companion (Koukourikos et al., 2019). In the 1960s, AAT was officially coined by Levinson (Levinson, 1969). Similar to previous studies, Levinson discovered that mentally ill individuals were more likely to socialize with an animal than another human.

Research suggests that AAT has become increasingly popular when it comes to children with ASD. Although often withdrawn, children with autism sometimes relate better to animals than to people. Therapists are better able to make therapeutic connections and strides with them when animals are around (Braun et al., 2009). Studies have found that children with autism interact and engage more in the presence of a therapy animal (Chandler, 2017). Animals have also been found to have calming effects on children when they hold or pet the animal (Koukourikos et al., 2019). The presence of therapy animals may therefore be a way to keep a child attentive to the intervention (Marcus, 2013). Engaging with a therapy animal resulted in better communication skills and prosocial behaviours (Enders-Slegers et al., 2019). Not surprisingly, a decrease

in autistic traits through AAT has been validated in previous studies (Chandler, 2017).

Dogs are the most commonly used animals in the therapeutic setting due to their social and affectionate nature. Research shows that children with ASD can benefit from time with a trained therapy dog (Turner, 2011). Therapists can utilize therapy dogs as an emotional bridge to tap into the client's worldview. Playing with a dog can help a child with ASD self-soothe, which can be a great antidote for meltdowns (Turner, 2011). Also, in Martin and Farnum's (2002) study, children with ASD were exposed to either a ball, a stuffed toy, or a therapy dog while being supervised by a therapist. Once the children played with the therapy dogs, they showed more signs of interaction, communication, and attention. They found it easier to be more proactive and accommodating in conversations with the therapist, indicating that the presence of a therapy dog is pleasant. Building trusting and meaningful relationships with therapy dogs can then carry over into relationships outside of the session room (Katcher, 2000).

In addition to dogs, there are a variety of other animals that can be used for AAT, from small animals like cats and guinea pigs to larger ones like horses and dolphins (Bert et al., 2016; Chitic et al., 2012; VanFleet & Faa-Thompson, 2014). Equine-assisted therapy (EAT), a psychotherapy that involves interaction with a horse, can be very beneficial both emotionally and socially. In a recent meta-analytical study, horseback riding was found to be a useful form of therapy in children with ASD (Trzmiel et al., 2019) and helped improve low moods in participants by building their self-confidence (Kern et al., 2011). It has been reported that children with ASD are able to develop motor skills and gain a sense of achievement by steering the horse (Chandler, 2017; Trzmiel et al., 2019). In addition to therapeutic horseback riding, therapy with farm animals is another form of therapy that is thought to be particularly effective for children with ASD. Therapist-led interaction with these friendly four-legged animals in a safe, structured context proves beneficial for social and communication skills. Recently, guinea pigs have become a popular choice when it comes to AAT. In a study by O'Haire et al. (2013), teachers were asked to rate their students on the interaction and play with guinea pigs. The teachers reported that their students showed greater social skills and fewer problem behaviours as a result of the activity.

Although there is already some evidence that AAT helps with autism, most previous scientific work uses a quantitative approach. In this case, a qualitative study is proposed to shed light on the possible positive components of AAT to better understand the process by which it works. Since individuals with ASD may have very limited speech skills,

this study aims to explore the phenomenon of AAT from the perspectives of therapists and parents.

## Method

### Participants

The study was based on a qualitative phenomenological design. Parents of children diagnosed with ASD and currently undergoing AAT, and therapists providing AAT for children with ASD were asked if they could participate in the interview. All participants were recruited from the AAT community and autism support groups. Demographic details of the participants are shown in Tables 1 and 2. Notably, all three professional interviewees in this study are special education specialists and certified animal-assisted therapists, with a minimum of a postgraduate degree and many years of experience in areas of psychotherapy, counselling, and coaching. During their past experiences, they integrated common counselling techniques with the non-verbal cues that presented on a child when animals are involved in therapy sessions.

### Materials

Two semi-structured interview schemas were developed; one directed at parents and one directed at AAT therapists. The advantage of semi-structured interviews is that they are prepared in advance, which allows the interviewer to be prepared, professional and competent during the interview. Both interview schemas were designed to explore and uncover participants' personal experiences, feelings and opinions about the AAT. In addition, they explored the potential impact of AAT in general.

### Procedure

The study was approved by the Psychology Ethics Committee University of Northampton. Participants were additionally advised that all data were handled in accordance with the General Data Protection Regulations (GDPR) 2018 and the UK Data Protection Act 2018 (DPA). Potential participants were approached via contacts within the AAT community and autism support groups. Interested participants were then able to contact us to follow up with further questions. Prior to data collection, information sheets were distributed to all participants detailing the purpose and methodology of the study. The sheet also clearly emphasized that participation in the study was voluntary and provided a detailed overview of the procedures used to maintain confidentiality and anonymity. Specially designed consent forms were also distributed to

**Table 1** Therapists' demographics

Pseudonym	Gender	Years of experience in AAT	Occupation
Sophie	Female	2	Occupational therapist
Erin	Female	5	Registered music therapist
Donna	Female	20	Counsellor and psychotherapist

**Table 2** Parents' and children's demographics

Pseudonym	Child gender	Child age	Child diagnosis	Age of diagnosis (Years)
Kate	Male	9	Autism spectrum disorder	3 years
Gemma	Male	3	Mild autism spectrum disorder	2 years, 6 months
Annie	Female	21	Anxiety, depression, ADHD and Autism spectrum disorder	16 years, 6 months
Christine	Male	9	Mild autism spectrum disorder	5 years

participants along with the information sheet. All participants signed and dated the consent form and returned it to the researcher, either in hard copy or via digital imaging.

Seven interviews took place over the course of two months. Prior to each interview, participants were reminded that they could opt out at any time during the interview and up to one month after the study was completed. They were also reminded of their right to decline to answer any questions without having to provide an explanation. Interviews were conducted via online video conferencing using social media applications (Skype and Facetime). This was introduced due to the coronavirus pandemic which made it impossible to meet the subjects face to face. Interviews lasted approximately 1 h and were voice or screen recorded. All participants gave consent for the interviews to be recorded. After the interview was conducted, debriefing forms were given to the participants and they were thanked for their participation.

All seven interviews were transcribed verbatim by the researcher. When personally identifying statements were made, such as names, places, etc., these were removed during transcription and replaced with (X). At this point, participants were also assigned pseudonyms so that they would not be identifiable. Only the researcher knows which pseudonyms were assigned to which participant.

## Analysis

Qualitative data were analysed using Thematic Analysis in NVIVO (version 12). Braun and Clarke (2006) explain that thematic analysis is a method that allows data to be categorized into themes and subthemes. The analysis used in this study was a bottom-up approach as the codes and

themes identified were extracted from close examination of the data, which is a more appropriate alternative than having an initial hypothesis and finding codes and extracts to support it (Maguire & Delahunt, 2017). The collected data was further analysed using the 6-step approach: 1. become familiar with the data, 2. generate initial codes, 3. identify themes, 4. review themes, 5. define and categorize themes, 6. create report. The first step involved reading the interview transcripts thoroughly to become familiar with the data. This involved listening to the voice recordings and transcripts individually several times. Once the coding process was complete, the codes were further reviewed and examined to interpret the data and create themes. Once the codes and themes were identified, the themes were reviewed and subthemes were created. Once the themes and subthemes were completed, the results were written in relation to the extracted data.

## Results

We have constructed three major themes in our analysis, and we will present our analysis by using themes as headings: perceived benefits of AAT, how AAT works, and potential limitations of AAT.

### Perceived Benefits of AAT

This theme includes narratives about the perceived benefits of AAT, as described by therapists and parents. All participants expressed positive views about the effectiveness and benefits of AAT for children with autism. Subthemes developed were: (1) physical, (2) sensory, and (3)

emotional benefits. AAT was perceived to have many benefits that are often interrelated.

### *Subtheme 1: Physical Benefits*

Overall, the physical benefits of AAT were emphasized by both therapists and parents. By physical benefits, we mean both being with the animals and being in a safe, therapeutic space. The role of the animal is central to AAT and is central to the sessions. The physical presence of animals as well as the emotional benefits they provide, such as friendship, love and companionship, are key benefits of AAT.

... it's a sense of companionship... (Kate, Parent).  
 ... the animals give a sense of purpose and love...  
 (Gemma, Parent).  
 An animal that offers unconditional, non-judgmental  
 friendship. (Erin, therapist)

Another benefit of AAT directly related to the presence of the animal is that the presence of the animal and therapist creates a safe space for clients. Participants indicate that the AAT environment and being with the animal provides a sense of a safe and secure place. One therapist (Erin) highlighted the “*unconditional, non-judgmental friendship*” that develops between the animal and the client, this may be another link to the importance of the animal during AAT. This allows clients to open up about personal issues.

I think that's one of the most important things too, the non-judgmental and their companionship, that they don't have to talk or anything. But if they do, the dog won't change their behaviour. Like a friendship. It's just like he's just a rock. (Erin, Therapist).  
 She's able to talk about some of the challenges that she's facing non-confrontationally, which, um, allows for an open conversation about possible solutions or strategies that she could consider. Um, and there's gives just a safe, protected place where there's no judgment. (Annie, Parent)

### *Subtheme 2: Sensory Benefits*

In the interviews, participants also emphasized the importance of sensory elements in AAT. Although each client and session is unique, there are many similarities when sensory elements are introduced. This can range from touching animals to being attentive to the environment. The therapist (Sophie) believes that animals are able to provide a dynamic multisensory experience, as different animals have different levels of arousal, which offers the potential for arousing and de-arousing influences.

Additionally, one therapist (Erin) highlighted the biological perspective of sensory benefits. Sensory stimulation releases oxytocin, which can have a calming effect.

Games and activities provide sensory stimulation for children with autism. The dog can be trained in various ways to help children with autism through different games and activities, such as tug of war, hide and seek, and massage. As a result of therapy, I have seen a reduction in meltdowns or tantrum, such as, humming and clicking noises, spinning objects, hand-posturing, roaming, and repetitive jumping, because the child was more aware of his or her surroundings in the presence of the dog. Additionally, ATT does not target the core symptoms of autism, but rather acts on some psychiatric symptoms related to autism, such as hyperactivity, aggression, irritability, and self-injury. However, there are different levels of arousal in different animals. Sometimes animals also trigger arousal or sensory overload leading to repetitive behaviour. Children with autism need a highly predictable and repeatable environment, referred to as a sensory social routine. (Sophie, Therapist)

Children with autism who participated in therapeutic horseback riding showed greater sensory seeking, sensory sensitivity, and less irritability and hyperactivity. While riding a horse, restless children are distracted, which makes them less jumpy. Therapy animals enjoy being petted by children, which increases feelings of affection in children with autism. Cuddling and touching animals cause the release of oxytocin, which calms the child. (Erin, Therapist)

### *Subtheme 3: Emotional Benefits*

Overall, the emotional benefits of AAT were highlighted by all participants. The perceived benefits were varied and included: building self-confidence, acceptance, bringing out hidden qualities and behavioural learning outcomes. This variety of benefits suggests that AAT is perceived as positive and effective for emotional wellbeing and development. Participants said that therapy animals did not reject people with autism, but made them feel accepted. It could be surmised that the clients' feeling of increased confidence and acceptance is the reason they are able to show their “*hidden qualities*” in the AAT. Two therapists in particular emphasized AAT's ability to “*go deeper into the person*” (Sophie, Therapist) and to “*show people's caring qualities*” (Donna, Therapist). In addition, they commented that therapists in AAT often see different sides or qualities of people than their usual carers. Individuals with autism often have problems with their social interactions, leading to experiences of rejection by others. This

may also be related to the “safe spaces” of physical benefits subtheme.

Not in the way people make judgments (Donna, therapist)

The connection between the animals and my son is amazing, the love is unconditional. It just makes it more effective because he feels like he is accepted. (Christine, Parent).

This could also be related to another perceived benefit of AAT, which is to combat loneliness.

And when you think about older people, maybe that connection and not being touched is another name. That’s about loneliness. It’s not a personal connection, it’s more of an attendant connexion that’s made. (Donna, Therapist).

Its very positive because a lot of them experience loneliness. (Erin, Therapist).

Building self-confidence is one of the key benefits highlighted by all participants. This is also closely related to participants’ reports of improved self-worth and focus. These aspects are inextricably linked. One therapist (Sophie) said that AAT can have an impact on an individual’s self-esteem.

In sessions, individuals are allowed to develop and grow, which can then give them a sense of increased locus of control and self-esteem because they realise what they can achieve in life. So, it’s more conducive. (Sophie, Therapist)

Individuals with autism can display significant challenging behaviour which can be difficult to manage, as illustrated by one parent’s report:

... she can be challenging in some areas... intense. So, once she has an idea in her head, it just becomes this focus... the social aspects about the conditions are very challenging for her. Controlling her emotions and impulsivity is also very challenging for her and the rest of our family. (Annie, Parent)

A significant motivator for parents who sent their children to AAT was that they were able to learn behavioural control, which they themselves struggled to teach their children, and to manage their challenging behaviours. Parents reported that they were very positive and satisfied with the progress made.

Yes, very pleased. (Gemma, Parent)

Yes. Satisfied overall. (Annie, Parent)

... Really positive all the time. (Kate, Parent)

Specifically, learning new behaviours, the ability to recognize emotions and deal with anger were cited as

learning outcomes by parents. These learning outcomes align with the goals of AAT, as stated by one of the therapists (Donna) to be a central outcome of AAT: clients learn the consequences of their behaviours on others, for example, as animals mirror and respond to clients’ emotions. A key outcome and benefit of this therapy is then perceived to be reflected in daily life outside of the therapeutic setting, as indicated by one mother (Christine) who said that increased behavioural control helps her to deal with challenging behaviour in other settings.

The animals will either mirror her emotions or respond to her emotions. (Donna, Therapist)

They’ll either walk away if it’s a horse... or they’ll react with body language. If it’s a dog, confusion, appeasement, then we can use body language to facilitate the client better understand the impact of that anger. And then we can start to work on how they can regulate. And the reward is that the animal will read and understand them best. They regulate their emotions and keep themselves calm. (Donna, Therapist)

... seems to have helped him regulate his behaviour and his emotional outbursts, which then helps me regulate his behaviour. (Christine, Parent)

Furthermore, AAT provides clients with the opportunity to acquire new knowledge in applied situations, which in turn allows clients to balance independence and responsibility. While these two aspects may sound contrasting at first, they complement each other in AAT: for example, one parent (Kate) explained that while her child is capable of making his own decisions, he must still put the needs of the animal first because he is the caregiver. In addition, AAT provides an opportunity to gain new knowledge not only about the animals, but the knowledge and skills gained can be applied to oneself.

This horse needs to be groomed because it is very muddy. When does it need to be showered? Do you know how often? So, you can relate to the general self-care of the individual and we say that especially maybe with people who are suffering. (Donna, Therapist)

So we think about all these things that we might put under the heading of self-care in the sense that we look at the animals that we can eat, but we can then generalize what we discover back to that person. (Donna, Therapist)

There’s another group of things that are more action-oriented, that are arranged so that you learn to take care of the animals. So, something about what do you feed them? How do you groom their fur? What does

the environment need to be like, what do they need in their daily kind of routines? (Donna, Therapist)

## Theme 2: How AAT Works

The second theme includes narratives about how AAT works differently than other forms of therapy. Participants described their experiences of AAT and how they believe it differs from other forms of therapy in terms of how it is delivered and perceived by therapists and users. The sub-themes that were developed were: (1) client-centred therapy and (2) mixed models.

### *Subtheme 1: Client-Centred Therapy*

Overall, therapists emphasized client-centred therapy. This may also be related to confidence building which, as mentioned earlier, is a key element of some therapy approaches. This is closely related to the participants' description of the focus on the client's needs.

So obviously everything is based on the client's needs and the goals that they want to set for themselves. (Donna, Therapist)

To ensure that the patient is at the centre of the therapy process, therapists reported that each AAT session is carefully planned and that a therapy plan includes an essential pre-assessment and then a uniquely designed session plan. This was felt by therapist to be important to the success of therapy and related to the needs and concerns of clients. For example, therapists need to ensure that clients respond well to an animal and do not react negatively. For example, some children with autism have significant problems with chickens because they flap. Therefore, the suitability of animals as part of therapy must be fully assessed beforehand.

Having an animal-assisted intervention might not ideal for some children. Sometimes some your children do not like animals. That could cause some triggering. So, the first point to make really is that you have to have a careful assessment process. (Donna, Therapist).

Participants said that it cannot be assumed that clients talk to all animals or that all animals are beneficial to clients; therefore, they emphasize the assessment process. Specifically, the assessment process is essential as it allows sessions to be tailored to each client's individual needs, whether emotional support, learning, understanding or general support. For example, one therapist stated that assessment is important because of the need to consider safety for the client, the therapist and the animals.

So, we can't assume anything. So have to conduct a pretty thorough assessment before we introduce animal-assisted people in any form, whether it's therapy or learning. (Donna, Therapist)

### *Subtheme 2: Mixed Models*

In addition, one therapist discussed the importance of different treatment models; highlighting the complexity of different models for delivering therapy services. One therapist (Donna) highlighted the benefits of using different models. In addition, she described different scenarios in which these models would be used; this highlights the importance of pre-assessment prior to the AAT.

So, one model would be what we call the triangle model where we have a client, an animal, a therapist. OK, which is good in certain circumstances. Right. But if we have a client who has quite significant needs, and if we're working with large animals or more than one animal, then we want to have two therapists with them. So that's called the diamond model. OK. And one of the advantages of the diamond model is that you have two pairs of eyes. So if you ask the question, what makes a session more effective? It might be because of which model you use. OK. If you have one person earlier in the session who has to watch the animal and the client, that therapist becomes dysregulated, it's very difficult. We split attention. Yes. And the whole session to notice what's going on. (Donna, Therapist)

That's called the star model. And that's where you work with people who all need to be supported by a caregiver... quite common when you're working with hospitals. Yes. We have occupational therapists and physiotherapists working together... dogs... the handler. The client may well have a personal assistant or support worker with them as well. (Donna, Therapist)

## Theme 3: Potential Limitations of AAT

This theme collates narratives about perceived limitations of AAT. The key limitation is the risk or concern that the animals might trigger autistic traits, possibly leading to a meltdown, agitation, anger, or upset the client. Two therapists emphasize the limitations that can be caused by the animal: whether it is the type of animal used/present, or the number of animals used/present during the session.

... chickens make people laugh because they're funny, the way they kind of run around and do things..., you have to be a little bit careful because

when chickens flap... of course that can be a trigger. (Donna, Therapist)  
 ... usually not so much dogs because they can make people quite nervous sometimes (Donna, Therapist)  
 When you take on a lot of animals, I think it can be a bit of a sensory overload sometimes. (Sophie, Therapist)

However, therapists indicated that this limitation can be overcome and controlled to some extent through thorough pre-assessment and session planning.

## Discussion

The purpose of the current study was to understand animal-assisted therapy and whether it is perceived by therapists and parents as an effective treatment for children with ASD. Using semi-structured interviews and analysing them with Thematic Analysis, the results suggest that AAT is perceived as effective for patients with ASD, both from the therapists' and parents' perspectives. The findings of the current study ties into a wealth of studies on ASD and the effectiveness of AAT that other research has reported. Specifically, the findings of Theme 1 provide important insights into the usefulness of AAT and the benefits that can be viewed through a biopsychosocial lens that have been highlighted in other studies (Becker et al., 2017; Chitic et al., 2012; VanFleet & Faa-Thompson, 2014). The main items mentioned in relation to perceived benefits were 'Physical benefits', 'Sensory benefits' and 'Emotional benefits', which is why the subthemes were named as such.

Participants are aware of the positive components of AAT and the impact it can have on children's lives. The biopsychological aspect: for example, stroking animals increases the release of endorphin, a chemical in the torso that often allows an individual to feel good, and can decrease stress hormones, including cortisol, norepinephrine and epinephrine (Braun et al., 2009; Marcus, 2013) (biological) interacting with an animal can reduce disturbed mood and improve an individual's overall quality of life (Chandler, 2017) (psychological), and can help build relationships (Morrison, 2007) (social). The narratives of the participants in the current study reflect these benefits and indicate that they are aware of them. These findings tie into a study by Morrison (2007), although his study did not focus specifically on individuals with autism. Morrison (2007) described the significant health benefits that AAT can influence, including improvement in blood pressure, heart rate and self-reports indicating improvement in depression, anxiety, quality of life, and loneliness. It may further suggest that there is a beneficial perspective to AAT that can influence an individual in more than one aspect.

Nonetheless, the participants in this current study acknowledge that the benefits may be different for each individual. This provides a further link to Theme 2, 'How AAT Works' and the different therapeutic models that can be used. Specifically, the findings in Theme 2 provide a comprehensive description of how AAT works and the different processes that can be considered when implementing AAT. Participants generally discussed that AAT is focused on a client-centred approach to therapy and the different models that can be considered for different participants. Which has been highlighted in previous studies (Altschiller, 2011; Chandler, 2017). The importance of client-centred therapy and the different models of therapy can be considered, which is why they were made subthemes.

Participants described the client-centred approach as the most important element of AAT. This can be related to previous researchers discussed in the introduction. For example, participants described AAT as being based on the client's needs and the future goals they would like to set. This links to a previous study by Altschiller (2011), although it explored a more holistic view of AAT. Altschiller (2011) described the different approaches to AAT and the positive effects that animal companionship and AAT have on different individuals, including individuals with autism. This may be further evidence that the therapeutic approach and delivery can have an impact on the client experience.

However, the participants in this current study recognize that the design of sessions is different for each individual, depending on their diagnosis and needs. Specifically, the findings from Theme 3 provide an overarching description of the potential limitations of AAT. The main limitations highlighted were the potential risk or concern of animals triggering clients, which could lead to meltdowns, agitation, anger or upset the client. This limitation has also been highlighted in other studies (Chandler, 2017). O'Haire (2013) also found the possible triggers that could be influenced by the animals involved during AAT. These may include the sounds of the environment or the kind of animals that need to be considered during the treatment.

The current findings suggest that the therapists and parents who participated in this study are aware of the positive components of AAT and the impact it can have on children's lives. Previous studies have reported their findings on how AAT works. It has been reported that interacting with an animal can decrease disturbed mood and improve a person's overall quality of life (Chandler, 2017). Animals have been found to increase the release of endorphin, which is a chemical in the trunk that often allows a person to feel good. Furthermore, clients who participate in AAT may also experience a decrease in stress



hormones, including cortisol, norepinephrine and epinephrine (Braun et al, 2009; Marcus, 2013).

In addition, there are a variety of opinions, experiences, and explanations that can describe how ATT can impact and improve the life of a child with autism. The results showed that the participants had similar responses and rationales regarding AAT and the effectiveness of the therapy. Through the participants' responses, the results can be categorized into the biological, psychological, and social impacts (Becker et al., 2017; Chitic et al., 2012; VanFleet & Faa-Thompson, 2014). Compared to these previous studies, participants emphasized the role of the human-animal bond in their rationales for the personal experience and usefulness of AAT. Despite differences in location, cultures, and environments, all participants had significantly similar responses. Additionally, some participants did not indicate the severity of the disorder they work/live with, this could be interesting for future research as to which severity of autism is most affected. Another aspect that could be explored would be to examine the usefulness of AAT with small or large animals. Future research could examine the effects of AAT on individuals with a variety of developmental and psychiatric disorders. Aside from the benefits such research could bring to therapy practice, this study would also add to the limited number of studies examining the perceptions of ATT from the angle of both therapists and parents of children with autism.

## Conclusion

In summary, this study reports on parents' and therapists' perceptions of AAT for children with autism. Therapists and parents noted the positive effects of animal-supported approaches on children with autism, particularly in relation to sensory, emotional, and physical functioning. Nonetheless, the study identifies that AAT is not a cure, but it may help alleviate some symptoms associated with ASD. The study also identifies the potential limitations associated with AAT, including the impact it may have on the client's emotional state. We believe that further qualitative and quantitative research is always needed, and that more programs focusing on the therapeutic use of animals in child therapy are also needed.

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**Data availability** The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Declarations

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Consent to Participate** Informed consent was obtained from all individual participants recruited in the study.

**Consent for Publication** All authors read the final version of the paper and give full consent for this paper to be published.

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