

Animal-Assisted Activities for Children with Autism Spectrum Disorders: Parent Insights

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This exploratory study was designed to investigate parental perceptions of animal-assisted activities for children diagnosed with autism spectrum disorder (ASD). In-depth interviews with 10 families provided insight into the possible mechanisms by which human-animal interactions impact socioemotional behaviors for children ASD. Parents suggested that interactions with animals are qualitatively different than interactions with humans allowing for enhanced communication and connection through reductions in anxiety and frustration. Bearing witness to these human-animal interactions and their concomitant impact on human-human interactions provided parents with feelings of happiness, optimism and hope.

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Children diagnosed with autism spectrum disorder (ASD) have a neurological variation classified as a developmental disability (Kapp, 2013). ASD impacts social interactions, communication, learning and sensory experiences across multiple contexts (American Psychiatric Association, 2013). Prevalence rates have rapidly increased, rising from one in 150 children in 1992 to one in 59 children in the United States (Centers for Disease Control and Prevention, 2016). Caregivers of children with ASD face pervasive and complex challenges obtaining and coordinating physical, mental health (Vohra, Madhavan, Sambamoorthi & St Peter, 2014) and educational services for their child. Much knowledge and skills are required to advocate for and manage the care of children with ASD. Parents must often master several tasks in order to manage their child's care, including acquisition of specialized knowledge and skills and scientific information about autism in order to select support for their child; mastering specialized teaching skills (Baker, Ambrose & Anderson, 1989; National Research Council, 2001; Ozonoff & Cathcart, 1998); obtaining information about where to find services; and gaining familiarity with special education laws to negotiate on behalf of their children at school and in clinical settings (Konstantareas, Homatidis & Plowright, 1992; Seligman & Darling, 2017). Moreover, due to the high prevalence of co-occurrence of other mental and physical health challenges, additional types of expertise are often required, outside that of ASD. Parents often coordinate with family healthcare and educational systems that are ill prepared to address the care of children with ASD (Corcoran, Berry & Hill, 2015; Vohra et al., 2014).

Multiple caregiver domains are impacted (Karst & Van Hecke, 2012; Picardi et al., 2018), including objective stressors, such as financial difficulties, relationship

strain with family members, friends and community and constrained activities at work and at home; and subjective stressors, such as depression, anxiety and stigma (Magliano et al., 2005). Caregivers of children with ASD experience higher levels of stress (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005; Hayes & Watson, 2013) reaching clinically significant levels (Rivard, Terroux, Parent-Bourier & Mercier, 2014) and greater mental health risks (Bromley, Hare, Davison & Emerson, 2004; Obeid & Daou, 2015). However, other studies reveal the co-occurring positives and benefits of caregiving for a child with ASD. Some parents reported a changed perspective on life, including an appreciation for the little things (Markoulakis, Fletcher & Bryden, 2012; Ooi, Ong, Jacob & Khan, 2016). Others described personal transformation, that included growth and strength, as well as gaining open mindedness, becoming less judgmental and more empathic (Corman, 2009; Markoulakis, Fletcher & Bryden, 2012).

Animal-Assisted Interventions

Animal-assisted interventions (AAI) target improvements in physical, behavioral and mental health through the inclusion of an animal in routine activities of outpatient settings, hospitals, schools, and courtrooms. A theory of how non-human animals have a positive effect on humans was put forth by E. O. Wilson (1984) as biophilia, a biologically-based love of all living things. This love, he posits, allows humans to have relationships with animals and to unconsciously benefit from animals' ability to perceive danger. In the presence of other sentient beings who can assist in keeping us safe, he suggests that we can experience a calmness that lowers arousal levels and promotes relaxation. More recent work suggests that the benefit some humans receive from other animals stems from companionship. Taking this one step further, some propose that humans benefit from relationships with non-human animals

because these animals can represent important attachment figures, fostering a sense of safety and unconditional love (Zilcha-Mano, Mikulincer, & Shaver, 2012). Oxytocin, the bonding hormone released during safe physical interactions such as breastfeeding and trusted intimate contact, is hypothesized to be released during interactions with animals. Although inconclusive, preliminary research suggests that oxytocin may be responsible for reducing anxiety and blood pressure while increasing trust, sociability and frustration tolerance during interactions with animals (Beetz, Uvnäs-Moberg, Julius & Kotrschal, 2012).

Animal-assisted interventions typically include either a range of small animals, including primarily dogs, or the use of equines. In some cases, these interventions are targeted, animal-assisted therapies (AAT) while others are animal-assisted activities (AAA). Activities can occur in almost any setting including classrooms, hospitals, outpatient centers, private homes, and barns. The literature on AAI is limited but growing. A meta-analysis of 49 non-controlled studies of AAT found that although many lacked methodological rigor, there was evidence to suggest that AAT may be effective in influencing treatment outcomes (Nimer & Lundahl, 2007). Although the evidence base for AAIs has grown since Nimer and Lundahl's 2007 study, it remains limited in number and rigor. In 2015, only seven studies met the inclusion criteria for a systematic review of randomized controlled trials in which AAT was used to address psychosocial outcomes (Maujean, Pepping, & Kendall, 2015). A few robust studies have found evidence that animal-assisted interventions targeting physical, social, emotional, and cognitive outcomes for children with ASD may be beneficial. O'Haire and colleagues (2013) recorded social interactions of children with ASD in social settings with

typically developing peers and through statistical analysis of blinded behavioral coding found that guinea pigs more than toys stimulated social interactions for the children with ASD. In a follow-up analysis, the authors found that the presence of animals during free play had a statistically significant impact on reductions in social anxiety in children with ASD as measured by skin conductance responses (O'Haire, McKenzie, Beck & Slaughter, 2015). A controlled study of the effects of a therapy dog on social skills training for youth with ASD had mixed results, although one finding indicated that the presence of a dog increased participants' learning and engagement (Becker, Rogers & Burrows, 2017).

While these studies suggest that the inclusion of animals in interventions for individuals with ASD may be beneficial, more rigorous studies are needed to fully justify the increasing investment that families and organizations are making in human-animal programming. Advocacy work toward an inclusive community and society addressing the social injustices that often isolate those with ASD requires an increased focus on adequate research (Bishop-Fitzpatrick, Dababnah, Baker-Ericzén, Smith, & Magaña, 2019). Researchers, especially those in social work, psychology and education, are called to join this advocacy work by conducting rigorous exploration of emerging fields of practice such as AAA. The call for a stronger evidence base to guide interventions in the field of autism is not only loud but ethical, as more practitioners, schools, non-profit organizations and corporations seek to provide intervention services for the growing population of children with ASD due to its increasing prevalence.

Methods

Given the dearth of knowledge about AAA and its impact from a broader familial perspective, this study was designed to

explore the parental perspective of animal-assisted activities for children with ASD. To achieve this goal, we partnered with a local nonprofit organization offering AAA to children of differing physical, emotional and neurological abilities from ages two through twelve. Children in this program participate in one-hour weekly, individual sessions at an accessible and inclusive barn for twelve weeks per session, working with a trained volunteer on an activity plan developed collaboratively by family members and the program's director. Children have opportunities to engage with miniature horses and donkeys, goats, sheep, rabbits, chickens and a pot-belly pig in enclosed spaces within the barn and secure outdoor areas. Activity plans include goals that target attainments such as expressive language, adherence to safety protocols, direction following and frustration tolerance. Each goal incorporates an animal of the child's choice. For example, if a child is working on frustration tolerance and chooses to work with a particular miniature horse, the activity might be learning to put on the horse's halter - an activity that requires several steps and the cooperation of an animal. Another activity that would focus on frustration tolerance might be learning to hold a rabbit so that it is safe and comfortable but not able to jump away. This delicate balance of holding and restraining while not restricting the animal's ability to breathe, for example, requires significant nonverbal communication and constant readjustment. As the child demonstrates the ability to manage this activity, the next step might be to invite the child to verbally describe the steps involved.

Family members did not participate in the activities with the children, although they were engaged in setting up the Activity Plan. In conversations with the staff prior to the study, we learned that parents had been reporting back on their insights into their children's activities, drawn from the stories

they heard in the car following the sessions and/or the behaviors they witnessed at home. In a few cases, parents remained on-site during their child's session for logistical travel reasons. Although not formally invited to participate in the activities, some parents on occasion were close enough to witness or overhear the activities.

Qualitative methodology was best suited for this study given that we sought to understand parent perspectives rather than test a certain hypothesis. As outsiders to the barn community, we were conscious to remain in a place of 'not knowing' as we actively sought to allow parents' stories to emerge as authentically and organically as possible.

Participants

After receiving IRB approval, we reviewed the files of 19 children and identified 12 who met our inclusion criteria: 1) they had completed an individual 12-week session of AAA within the last 12 months, and 2) had been diagnosed with ASD. We emailed a recruitment letter to the parent(s) of these 12 children and successfully enrolled 10 family units in the study. In some cases, the family unit was one parent, in others it was both parents, and in one case it was a grandmother who had guardianship. As a way to fully adhere to the voluntariness of participation in the study, we did not follow up with the two families who did not respond to our email outreach.

Procedure

We developed a short interview guide designed to explore the parents' experiences with having a child enrolled in an AAA program, and conducted the interviews as deep listeners with occasional probing for clarity when needed. Interviews were held in participant homes or in mutually-agreed upon locations, lasting approximately 90 minutes. Each interview was digitally recorded on a secure, handheld device and then uploaded for professional transcription using

encryption software. We used a semi-structured interview guide with five open-ended questions including how they chose a program with AAA, and what effects, if any, they perceived the activities to have on their child.

Once all 10 interviews were complete and transcribed, we reviewed transcripts for commonalities and, ultimately, for themes. We used a grounded-theory approach to data analysis by focusing on the data and allowing themes to emerge (Strauss & Corbin, 1998). To do so, two members of the research team independently coded the transcripts using whatever coding language seemed to “fit” with the sentiments being expressed by parents. We then compared the independent coding and agreed on five common themes. We developed a coding scheme and engaged a third, outside reviewer to test our scheme. Throughout this second phase, we engaged in ongoing discussion about the themes that arose, seeking negative cases and challenging personal assumptions as a way to enhance trustworthiness and mitigate the risk of confirmation bias. Ultimately, we collapsed the five-theme coding scheme into the three themes reported here. We regularly acknowledged that parents’ reports of their children’s experiences with AAA may well have been influenced by the social nature of the qualitative interview (Carr, 2011) through a desire to “give” us what they may have expected we wanted in the form of reports that AAA was “working.” If this desire existed, it may have been driven by a perception that the findings from our study could influence the program’s future viability.

Results

Three themes emerged related to the perceived impact that the AAA had on children and their parents. Parents reported that 1) participation in the program positively impacted their children’s social emotional behavior; 2) interaction with the animals

provided their children opportunities for connection and communication; and 3) the parents experienced feelings of happiness, optimism and hope.

Social Emotional Impact

Animal-assisted activities do not require children to engage in verbal communication. Animals respond to other cues, including touch and physical guidance. The fact that these activities do not rely on language often makes the interactions more accessible to children on the autism spectrum, especially those with limited language. A parent commented on this, sharing that:

He likes animals, he doesn’t have to talk to them, he can be close to them, he can touch them and he can pet them and he can feed them. He can provide them with whatever they need but he doesn’t have to talk to them.

Parents in the study noted that animals appeared to have different expectations than people did when interacting with their child. One parent noted, “I just think that the animals don’t require things of him. And he feels comfortable and welcomed.” Another explained, “Animals don’t talk, they don’t say mean things to you. People can be mean, they can tease, they can bully.” Parents, who often witness their child across multiple settings interacting with diverse types of people, compared the interactions that their child had with animals to the interactions that they had with other people. In the presence of animals, the children in this program appeared able to relax, respond with gentleness and experience decreased anxiety. As one mom explained, “He can be himself [at the barn] and not have to work so hard, and I think it’s just relaxing.” Once relaxed, the children appeared to have a higher tolerance for frustration and even a sense of acceptance of others’ behavior. A parent reflected on this

shift noting, “If the animal isn’t meeting her expectations, she seems to manage that much better than...if [a human] isn’t.” Dashed expectations seem to be met with a degree of acceptance that is not always present in their human-to-human interactions.

Parents consistently reported that their children’s social emotional behaviors were different following participation in the AAA program. In many cases, they noted immediate impacts on attitudes and mood states, while in others they attributed improved behaviors to participation in the program. One mother shared, “Oh, it’s amazing. Just the fact that he can sit there calmly and be so gentle.” The perception that children were calmer was shared by another parent who reported, “It has a calming effect on him. There is no doubt in my mind that it does.” The concept of gentleness was echoed by a parent who was surprised by how non-aggressive her typically agitated son could be with the barn animals, “He doesn’t show aggression when he’s near the animals.”

Reduced frustration and aggression extended beyond interactions with animals to interactions within the family system. One parent noted that “[The Program] showed her how to be gentle and that carries over into the family.” The idea that the family system might also benefit from children’s participation in the program was echoed by another mother who shared, “After the Barn she’s just so agreeable. She’s happy, she’s relaxed. We’ll have dinner; we’ll take a bath. It’s just a perfect evening. It’s not a fight for her to do things.”

Communication and Connection

Increased verbal and non-verbal expression appeared to be a corollary of the calmness and sense of ease that being with animals elicited in the children. Parents indicated that their children were able to interact with animals during the activities in ways that seemed more natural and/or intuitive than the ways that they interacted

with people. As one mother of a nonverbal child shared, “It’s very hard to explain what I observed about him with animals. But, there is a communication that occurs.” For this parent, the fact that there was some form of communication that occurred between her child and animals at the barn was surprising. She had previously not known whether her son was able to communicate at all. One parent hypothesized that, “Maybe [the calmness] gives him the space to be able to articulate what’s going on.”

Parents reported that the way that their children related to the activity animals was different than the way they relate to humans. One parent described, “He clearly relates to animals in a way that he does not always relate to people.” Using almost the same language, another parent explained, “It’s clear that she relates to animals in a much more comfortable way than she relates to people in general.” The discernable difference in the children’s connection with the animals was echoed by another parent who explained, “Any time we would be around animals, she would clearly be a different person.”

The ability to relate differently appeared to allow children to also communicate differently, especially with spoken language. One child’s mother reported that her daughter’s language usage and behavior are different when she is at the barn. “She’s opening up. She’s using more language - different language than she would use in a school setting; different behavior.” Another mother described her daughter’s interactions with the animals at the barn. “She will tell the cat and the pony everything that happened in her life that day without being asked – but she doesn’t tell me.” A father hypothesized that his daughter’s increased ability to use verbal language at the barn was a result of the different environment. “She can express herself more easily [at the barn] because it is less

stimulating.” Another hypothesized that her anxious son’s behavior at the barn was markedly different because of the way that the animals interacted with him. “You have a child who is scared of everything, and that animal can adjust itself [because] it pays attention to the cues... People out in the community don’t tend to pay attention to [those cues].”

Some parents found that participation in animal-assisted activities improved their child’s communication with other people, with one explaining, “He was interacting more with the animals, [and it] carried over and helped him interact with people, definitely.” The improvement in the child’s communication skills were observed both at home and outside of the family system. On the improvement in her child’s communication, one parent remarked, “He was acting up...and I said, ‘What’s happening?’ and he said, ‘Well, I’m nervous about Clara’s party.’ There was a time when he couldn’t have said that...part of it has to do with [the program].” Advancement in the children’s communication skills extended beyond the interactions with their immediate families. One parent reflected on her daughter’s expanded communication skills, saying “She can carry on a conversation now with somebody—that was unheard of before...I really can’t even explain it; she just is different. She is a different kid.” Another shared, “[The program] has definitely helped him come out of his shell.”

Happiness, Optimism and Hope

As researchers, we found one of the most noteworthy results of the study to be the way in which parents talked about their children’s experiences with AAA. Consistently, parents shared with a remarkable level of emotional openness. They eagerly invited us into their homes and shared deep, personal stories about parenting children on the autism spectrum. In all but one case, parents cried during the interviews

while talking about their children’s participation in the barn program. Their tears reflected feelings of happiness and joy, often as a result of seeing improvements in their children’s ability to communicate and connect. One parent shared about the relief she felt just seeing her child be happy, “When I would go to pick him up [at the barn] he was a happy boy, and I had never had that happen with him before. Every time we would pick him up at daycare...he would be angry.” Another parent explained:

If he hadn’t changed because of those animals—because of the trust and the calmness and [learning to] make relationships with the animals—I wouldn’t have been able to have a relationship with him and be able to teach him what he needs to know for life.

The changes observed in their children appeared to offer parents optimism about their children’s future. Summarized concisely, one parent stated, “Parents just really want to believe that their child can do something that they will be happy with.” This newfound sense of hope was shared by several parents. One mother reported, “[Seeing your kid with the animals] gives you some hope. It gives you happiness. As a parent, it gives you pride.” With tears streaming down her face, another shared, “I couldn’t be happier that, oh my gosh, there is hope [for my child].” Largely, these feelings of hope were connected to the way in which parents perceived changes in their children outside of the barn. “They [the animals] changed her behavior; they changed the way she relates to the world.” In the interviews, these reflections were shared with open joyfulness. One mother commented, “I’m smiling from ear to ear right now [talking about this].”

Discussion

This study provides insight into parental perceptions of the impact of AAA on

children with ASD. Parents reported that the interactions their children had with animals in structured activity settings led to reductions in anxiety and increases in the ability to tolerate frustration. Largely, they attributed this shift in social and emotional functioning to the quality of the interaction between the child and the animal, often comparing them to the quality of interaction with people. Parents in the study noted that the adults and other family members place different types of demands on their child than animals at the barn did, crediting the difference in the amount of 'work' that was required of the child to manage their behaviors and responses. They perceived that this difference in the quality of the interactions created safety for children who may otherwise face challenges when interacting with adults or peers. Further, they attributed the reductions in anxiety, anger, and frustration, often found in children on the autism spectrum, to this quality of safety within interactions with animals. Identification of the mechanism by which animals' different social expectations allowed the children in this program to be calmer, gentler and more forgiving is a key finding. Beetz (2017) suggests that human-animal interaction relies on implicit-experiential processing whereas human-human interaction requires explicit-cognitive processing, providing a possible explanation for the perceived reduction in demand. She explains, the implicit experiences of social interactions rely primarily on processing sensory input whereas explicit social interactions depend on processing verbal input.

Parents drew linkages between the changes in their children's emotional states, resulting from participation in activities with animals, and enhanced connection and communication with other people. In some cases, connection was improved within the family system, while in others there were

notable differences in school and social settings as the ability to tolerate frustration increased. The mechanism by which this happened is beyond the scope of this study, although theories suggest that behavior change may be impacted by the kind of intrinsic motivation that is aroused in children when interacting with animals (Beetz, 2017). The motivation to engage coupled with the low demand that animals make for verbal interaction may provide a 'safe' environment for children to practice social skills. It is possible that children's time at the barn served as a place to practice social skills that had already been acquired, suggesting that AAA may influence social competence in children with ASD. We might also understand the enhanced ability to connect and communicate following human-animal activities as a function of the acquisition of new social skills. Parents in O'Haire's 2013 study similarly reported positive changes in their children's social functioning following an 8-week, classroom-based guinea pig program.

That parents reported feelings of happiness, optimism and hope is not surprising given their perceptions about the impact that AAA had on their children's social functioning. In a related study, Tan and Simmonds' (2018) study of parental perceptions of equine-assisted interventions had similar results. Parents in the study reported that the experience of seeing their children socially progress gave them a new sense of happiness and pride. Given the strain that can come with parenting a child with ASD, it is plausible that bearing witness to positive socialization may have reduced perceived levels of stress. Reductions in reports of parenting stress were found in a study that followed 49 families for nine months following the introduction of an autism service dog. Researchers in this study identified lowering levels of morning cortisol, the primary hormonal indicator of

stress, as the main mechanism for stress reduction (Fecteau et al., 2017). The way in which the experience of hope impacts parents of children with disabilities has been studied by others seeking to examine positive psychology and strengths based factors in these families (Ekas, Pruitt & McKay, 2016; Faso, Neal-Beavers & Carlson, 2013; Lloyd & Hastings, 2009). Lloyd and Hastings (2009) reported that ‘hope agency’—the perception that goals can be met—was a resilience factor for parents’ psychological well-being. Ekas, Pruitt and McKay (2016) also reported that greater hopeful thoughts were associated with decreased loneliness.

The way in which parents participated in this study suggests that they wanted to be witnessed, to be heard, when they are able to share positive things about their child. Parental involvement in all stages of intervention development is key to Bishop-Fitzpatrick and colleagues’ (2019) call to “...create an autism intervention consortium comprised of interdisciplinary researchers and practitioners, as well as individuals on the autism spectrum and their family members” (p. 12). This includes further examination of parental involvement in animal programming to explore the possibility that it could have empowering and therapeutic benefit to the family system of a child with ASD.

Several limitations to this study must be noted, specifically regarding its design. With the goal of exploring narratives as a way to elicit themes that could potentially be tested in a larger, more rigorously-designed study, our findings are limited. They represent the experiences of a convenience sample of a group of parents from one specific program offering AAA. Parents who chose to be a part of the study may be systematically different in some ways from those parents who did not choose to participate. The small nature of the barn community may have been a driving factor if

parents were unsure of how confidential their interview would be, especially if they did not have positive things to share. It is also possible that those families who receive financial support so that their children can participate may have felt an unintended obligation to participate. Additional studies are needed to test the types of mechanisms that parents identified in this study. From there, studies should seek to test parents’ hypotheses about the mechanisms by which their children’s behavior was altered by interactions in a structured AAA program.

Conclusion

Potential mechanisms that emerged from the analysis of the qualitative data collection inform the design of future studies that can rigorously test the effects of AAA on child and family outcomes. This study highlights parental perceptions about the potential implications of AAA as an intervention with children diagnosed with ASD. For the participants of this exploratory study, AAA helped their child with communication and connection. Some parents shared stories of increased frustration tolerance. The parents also reported experiencing feelings of happiness, optimism and hope as a result of their child’s participation in the AAA program. As such, those who provide support to children diagnosed with ASD and their families may need to give further considerations of the familial benefits of AAA. More consideration should be given to the mechanisms by which families might participate in, witness or learn about their child’s experiences in AAA given the initial findings from this study that suggest a potential benefit to the family unit. Additionally, further investigation of the relationship between the construct of hope and parental outcomes is warranted, including ways that animals might influence experiences of hope among parents of children with ASD and other disabilities.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Baker, B. L., Ambrose, S. A., & Anderson, S. R. (1989). Parent training and developmental disabilities. *Monographs of the American Association on Mental Retardation*, 13(1), 1-259.
- Baker-Ericzen, M. J., Brookman-Frazee, L., & Stahmer, A. (2005). Stress levels and adaptability in parents of toddlers with and without autism spectrum disorders. *Research and Practice for Persons with Severe Disabilities*, 30(4), 194–204. doi:10.2511/rpsd.30.4.194
- Becker, J. L., Rogers, E. C., & Burrows, B. (2017). Animal-assisted social skills training for children with autism spectrum disorders. *Anthrozoös*, 30(2), 307-326. doi:10.1080/08927936.2017.1311055
- Beetz, A. M. (2017). Theories and possible processes of action in animal assisted interventions. *Applied Developmental Science*, 21(2), 139-149. doi:10.1080/10888691.2016.1262263
- Beetz, A.M., Uvnäs-Moberg, K., Julius, H., & Kotrschal, K. (2012). Psychosocial and psychophysiological effects of human-animal interactions: The possible role of oxytocin. *Frontiers in Psychology*, 3(234), 1–15. doi:10.3389/fpsyg.2012.00234
- Bishop-Fitzpatrick, L., Dababnah, S., Baker-Ericzén, M. J., Smith, M. J., & Magaña, S. M. (2019). Autism spectrum disorder and the science of social work: A grand challenge for social work research. *Social Work in Mental Health*, 17(1), 73-92. doi:10.1080/15332985.2018.1509411
- Bromley, J., Hare, D. J., Davison, K., & Emerson, E. (2004). Mothers supporting children with autistic spectrum disorders: Social support, mental health status and satisfaction with services. *Autism*, 8(4), 409-423. doi:10.1177/1362361304047224
- Carr, E. S. (2011). Qualifying the qualitative social work interview: A linguistic anthropological approach. *Qualitative Social Work*, 10(1), 123-143. doi:10.1177/1473325009359389
- Centers for Disease Control and Prevention. (2016). *Autism spectrum disorder (ASD): Data & statistics*. Retrieved from <https://www.cdc.gov/ncbddd/autism/data.html>
- Corcoran, J., Berry, A., & Hill, S. (2015). The lived experience of US parents of children with autism spectrum disorders. *Journal of Intellectual Disabilities*, 19(4), 356–366. doi:10.1177/1744629515577876
- Corman, M. K. (2009). The positives of caregiving: Mothers' experiences caregiving for a child with autism. *Families in Society*, 90(4), 439-445. doi:10.1606/1044-3894.3923
- Ekas, N., Pruitt, M., & McKay, E. (2016). Hope, social relations, and depressive symptoms in mothers of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, (29-30), 8-18. doi:10.1016/j.rasd.2016.05.006
- Faso, D., Neal-Beevers, A., & Carlson, C. (2013). Vicarious futurity, hope, and well-being in parents of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 7(2),

- 288-297.
doi:10.1016/j.rasd.2012.08.014
- Fecteau, S. M., Boivin, L., Trudel, M., Corbett, B. A., Harrell Jr, F. E., Viau, R., ... & Picard, F. (2017). Parenting stress and salivary cortisol in parents of children with autism spectrum disorder: Longitudinal variations in the context of a service dog's presence in the family. *Biological Psychology*, 123, 187-195. doi:10.1016/j.biopsycho.2016.12.008
- Hayes, S. A., & Watson, S. L. (2013). The impact of parenting stress: A meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 43(3), 629-642. doi:10.1007/s10803-012-1604-y
- Kapp, S. (2013). Interactions between theoretical models and practical stakeholders: The basis for an integrative, collaborative approach to disabilities. In E. Ashkenazy & M. Latimer, (Eds.), *Empowering leadership: A systems change guide for autistic college students and those with other disabilities* (pp. 104–113). Washington, DC: Autistic Self Advocacy Network..
- Karst, J. S., & Van Hecke, A. V. (2012). Parent and family impact of autism spectrum disorders: A review and proposed model for intervention evaluation. *Clinical Child and Family Psychology Review*, 15(3), 247-277. doi:10.1007/s10567-012-0119-6
- Konstantareas, M. M., Homatidis, S., & Plowright, C. M. S. (1992). Assessing resources and stress in parents of severely dysfunctional children through the Clarke modification of Holroyd's Questionnaire on Resources and Stress. *Journal of Autism and Developmental Disorders*, 22(2), 217-234. doi:10.1007/BF01058152
- Lloyd, T. J. & Hastings, R. (2009). Hope as a psychological resilience factor in mothers and fathers of children with intellectual disabilities. *Journal of Intellectual Disability Research*, 53(12), 957-968. doi:10.1111/j.1365-2788.2009.01206.x
- National Research Council. (2001). *Educating children with autism. Committee on educational interventions for children with autism.* In C. Lord & J.P. McGee (Eds.). *Division of Behavioral and Social Sciences and Education.* Washington, DC: National Academy Press.
- Magliano, L., Fiorillo, A., De Rosa, C., Malangone, C., Maj, M. & National Mental Health Project Working Group (2005). Family burden in long-term diseases: A comparative study in schizophrenia vs. physical disorders. *Social Science & Medicine*, 61(2), 313-322. doi:10.1016/j.socscimed.2004.11.064
- Markoulakis, R., Fletcher, P., & Bryden, P. (2012). Seeing the glass half full: Benefits to the lived experiences of female primary caregivers of children with autism. *Clinical Nurse Specialist*, 26(1), 48-56. doi:10.1097/NUR.0b013e31823bfb0f
- Maujean, A., Pepping, C. A., & Kendall, E. (2015). A systematic review of randomized controlled trials of animal-assisted therapy on psychosocial outcomes. *Anthrozoös*, 28(1), 23-36. doi:10.2752/089279315X14129350721812

- Nimer, J. & Lundahl, B. (2007). Animal-assisted therapy: A meta-analysis. *Anthrozoös*, 20, 225-238. doi:10.2752/089279307X224773
- Obeid, R., & Daou, N. (2015). The effects of coping style, social support, and behavioral problems on the well-being of mothers of children with autism spectrum disorders in Lebanon. *Research in Autism Spectrum Disorders*, 10, 59-70. doi:10.1016/j.rasd.2014.11.003
- O'Haire, M. E., McKenzie, S. J., Beck, A.M., & Slaughter, V. (2013). Social behaviors increase in children with autism in the presence of animals compared to toys. *Anthrozoös*, 8(2), 1-10. doi:10.1371/journal.pone.0057010
- O'Haire, M. E., McKenzie, S. J., Beck, A. M., & Slaughter, V. (2015). Animals may act as social buffers: Skin conductance arousal in children with autism spectrum disorder in a social context. *Developmental Psychobiology*, 57(5), 584-595. doi:10.1002/dev.2131
- Ooi, K. L., Ong, Y. S., Jacob, S. A., & Khan, T. M. (2016). A meta-synthesis on parenting a child with autism. *Neuropsychiatric Disease and Treatment*, 12, 745-762. doi:10.2147/NDT.S100634
- Ozonoff, S., & Cathcart, K. (1998). Effectiveness of a home program intervention for young children with autism. *Journal of Autism and Developmental Disorders*, 28(1), 25-32. doi:10.1023/A:1026006818310.
- Picardi, A., Gigantesco, A., Tarolla, E., Stoppioni, V., Cerbo, R., Cremonte, M., ...Nardocci, F. (2018). Parental burden and its correlates in families of children with autism spectrum disorder: A multicentre study with two comparison groups. *Clinical Practice and Epidemiology in Mental Health: Clinical Practice & Epidemiology in Mental Health*, 14, 143-176. doi:10.2174/1745017901814010143
- Rivard, M., Terroux, A., Parent-Boursier, C., & Mercier, C. (2014). Determinants of stress in parents of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 44(7), 1609-1620. doi:10.1007/s10803-013-2028-z
- Seligman, M., & Darling, R. B. (2017). *Ordinary families, special children: A systems approach to childhood disability*. New York, NY: Guilford Publications.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Grounded theory procedures and technique* (2nd ed.). Newbury Park, London: Sage.
- Tan, V. X. L., & Simmonds, J. G. (2018). Parent perceptions of psychosocial outcomes of equine-assisted interventions for children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48(3), 759-769. doi:10.1007/s10803-017-3399-3
- Vohra, R., Madhavan, S., Sambamoorthi, U., & St Peter, C. (2014). Access to services, quality of care, and family impact for children with autism, other developmental disabilities, and other mental health conditions. *Autism*, 18(7), 815-826. doi:10.1177/1362361313512902
- Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.
- Zilcha-Mano, S., Mikulincer, M., & Shaver, P. R. (2012). Pets as safe havens and secure bases: The moderating of pet attachment orientation. *J Res Pers*, 46(5), 571-580. doi:10.1016/j.jrp.2012.06.00