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ORIGINAL PAPER

Children with Autism in Wild Nature: Exploring Australian Parent Perceptions Using Photovoice

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Abstract

Access to wild nature may be beneficial for human health and well-being (Gill 2014). Time in wild nature has been found to have unique benefits for children with Autism Spectrum Conditions (ASC), although research on access to wild nature for children with ASC is scarce (Blakesley et al. 2013). Parents of children with ASC have unique insights into their children's lives (Harte 2009). Using a qualitative method this small scale study included three parents of children with ASC aged between five and 10 recruited from an Australian online support group. Data were collected using the participatory method of Photovoice. Parents took photographs of their children in wild nature, with their children's assent, and shared their perspectives with the other parent participants. Interviews with individual participants were conducted using Facebook private messaging. Data were analysed with participation from the parents using thematic analysis. The three parents reported that time in wild nature supported their children's deep interests, helped them adapt to change, supported their creative and imaginative play, and calmed them. Reported barriers included being too busy with therapy appointments, balancing the needs of siblings with ASC, sensory challenges, and the exhaustion of daily life. Parents also reported that the Photovoice methodology helped them gain insight into their own perspectives. This small scale study adds some support to the research around wild nature and children with ASC, and speaks to the benefits of the Photovoice approach.

Keywords Autism · Children with autism · Wild nature · Photovoice · Parents · Facebook

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Background

John Muir (1901, p.1) stated that "wildness is a necessity," and researchers continue to find that access to the natural environment is essential for human health and well-being (Gill 2014). Wild nature, or the natural environment such as rivers, beaches, bush and forest, may provide abundant opportunities for children to play independently and creatively (Kreutz 2014). In this study, the term 'wild nature' is used rather than 'green space' consistent with Malone et al. (2015) and Balmford et al. (2011). Although the division of space into 'natural' and 'non-natural' has been debated as artificial, and the concept of 'nature' as an idealised environment critiqued (see Malone 2016; Taylor 2011), access to wild nature has been shown to provide greater lifelong connection to nature and richer psychological benefits for humans than 'domesticated' nature due to its size, lack of restrictions, and increased biodiversity (Fuller et al. 2007; Wells and Lekies 2006). Wild nature includes a varied range of less-managed environments with the possibility of risk, in contrast to highly managed spaces sometimes offered as alternatives to children with disabilities (Von Benzon 2010).

Ensuring access to natural settings for typically-developing children, that is children without an identified educational need (Curtin et al. 2014) has been the focus of a significant amount of research. There is also an increasing body of research focusing on specific groups such as children with disabilities (e.g. Li et al. 2019; Van den Berg and Van den Berg 2011). One such disability is Autism Spectrum Condition (ASC), a common, complex condition which can affect physical, intellectual and emotional development (Abu-Akel et al. 2019). Prevalence of ASC in an Australian sample which relied on parent and teacher diagnosis was 2.5% (Randall et al. 2016). Currently, educational support for children with ASC in Australia is provided through fragmented services which may privilege expert knowledge over the lived experiences of people with disabilities, their parents and educators (Whitburn et al. 2017). Ensuring that the discussion around access to nature includes the perspectives of parents of children with ASC – as part of a broader discussion involving the voices of children with ASC, adults with ASC reflecting on their childhood, and educators working with people with ASC – is essential for providing appropriate educational environments. This is especially important, as over-idealised views of parenting in nature may act as a barrier to accessing nature for some families (Horton 2017; Malone 2016).

This study has focused on the experiences of parents of children with ASC, as they have a unique, insightful (and some would argue more accurate) perspective on their child's strengths, needs, and interests (Harte 2009). As yet there is limited research exploring the perspectives of parents of children with ASC and access to nature.

A method that may assist in unlocking parental perspectives is the participatory research methodology called Photovoice, first articulated by Wang and Burris (1994). Photovoice asks participants to share photographs which reflect their perspectives around the themes of the research, offering a unique opportunity to "see" the relevant issues from the participants' points of view (Booth and Booth 2003). Taking and selecting photographs to share can also assist participants in gaining insight into their own ideas, helping them effectively advocate for theIR needs and their families' needs, and has been used previously with families of parents with ASC (Harte 2009). By using Photovoice, parents of children with ASC may be able to comprehend with more awareness the issues surrounding access to wild nature for their children and be able to share that knowledge with others.

Literature review

There is a significant body of literature focusing on the importance of children accessing wild nature, with Gill (2014) reviewing over two hundred studies, from those emphasizing neonatal health to stress reduction, citing mostly positive effects. There is, however, limited research focusing specifically on children with ASC in wild nature, either directly or perceived (Blakesley et al. 2013).

Over the last twenty years, theoretical discussion in support of the benefits of accessing nature has focused on issues such as embodied cognition (Corazon et al. 2011), attention restoration theory (Kaplan 1995) and the evolutionary-based biophilia (Ulrich 1993). There has also been concern with the social and cultural relationship, as in the theory of therapeutic landscapes (Bell et al. 2015). A socio-ecological approach acknowledges not only the individual but also their families, communities, the institutions they inhabit, and the public policies which affect them, as well as the interplay between these factors (Obrusnikova and Cavalier 2011). This study uses a socio-ecological framework to explore issues around access to nature for children with ASC, including individual, interpersonal, and community access to wild nature.

Individual access to wild nature

Several researchers have interviewed teachers and parents of children with disabilities including ASC and have reported that parents consider time in nature to be a preferred activity for their children (Blake et al. 2018; Blakesley et al. 2013; Chang and Chang 2010). Li et al. (2019), who interviewed 22 caregivers of children with ASC living in two cities in China, reported that parents identified time outdoors, especially in areas featuring wilderness, as relaxing for their children, and provided the opportunity to play freely, especially with "loose parts" (p.73) such as twigs and leaves. Von Benzon (2011), who conducted a year-long program in a UK school catering for children with disabilities including ASC reported that the children were far less likely to have accessed what may be considered ordinary outdoor experiences such as picking blackberries or building an outdoor den, and were less comfortable in nature than typically-developing children. Larson (2006), who explored family routines with nine mothers of children with ASC in the USA, reported that parents of children with ASC felt they needed to do extensive preparation in order for their children to access the outdoors, and that their children needed repeated exposure in order to overcome initial discomfort with their new experiences.

Interpersonal access to wild nature

Play in wild nature is rarely a solitary activity; research has focused on the relation between access to nature and social interaction. Studies by Bagby et al. (2012) in the USA and Blakesley et al. (2013) in the UK have found improved social interaction to be one of the key benefits identified in relation to children's engagement in nature. Zachor et al. (2016) in Israel found an increase in social communication skills in preschool children with ASC after a 13-week outdoor adventure activity. Li et al. (2019) in China reported that parent-child interaction improved while spending time in nature, while Shields and Synnot (2016) in Australia conducted a series of focus groups

with children with ASC, their families, and recreation workers, and found that intense social support from a parent or teacher was needed to ensure equal access for children with ASC to recreation activities, including those in wild nature.

Community access to wild nature

Access to wild natural spaces may increase access to the wider community for children with ASC, increasing acceptance and awareness in broader society. In a report on Swedish programs for people with disabilities, Brodin (2009) found that young children with disabilities including ASC were able to play comfortably with neighbourhood children in natural settings. Li et al. (2019) also found that parents reported that their children were able to play alongside others in nature, although interactions in outdoor spaces could be challenging due to judgemental attitudes from others. Horton (2017), who interviewed the parents of children with disabilities using a local "country park" in the UK, found that feeling apprehensive about possible negative experiences with other members of the community was a chief barrier to accessing the space.

Research problem and questions

The research cited above demonstrates that children with disabilities, including ASC, may experience a range of benefits when accessing nature, including enjoyment and relaxation, increased social interaction, and increased access to nature. This research has also indicated a range of barriers to access, including sensory preferences, the need for high social support, and negative reactions from the community. While there may be increased interest in providing access to wild nature for children with ASC (Blakesley et al. 2013; Brewer 2016), there is little research focusing specifically on children with ASC; there is also limited research focusing on parent's perspectives of their children in wild nature. The following research questions were designed to guide exploration of parental perceptions of benefits and barriers of access to wild nature for their children with ASC.

1. What benefits do parents of children with ASC perceive that time in wild nature brings?
2. What barriers do parents of children with ASC perceive towards spending time in wild nature?

Method

Photovoice and access to wild nature

Photovoice, first developed by Wang and Burris (1994) is alternately described as a research method (Ciolan and Manasia 2017), a health promotion strategy (Wang and Redwood-Jones 2001), and as empowerment education (Wang and Burris 1997). Photovoice has been used with parents of children with ASC. Harte (2009) asked five families, including five children with ASC and five mothers, to take photographs of their children's daily lives to uncover their children's needs and assets. It was found

that this process helped share the mother's expert knowledge of their children's needs with others. Olibris (2015) used Photovoice with three parents of children with ASC and reported that parents felt it a successful method of critically reflecting upon the research question, as well as empowering them to lobby for change.

Photovoice has also been used to explore children's play in wild nature. Adams et al. (2017) provided 28 children in South Africa with cameras to record their perspectives on their nearby nature, and found the methodology helped the children make sense of the research question and provide the researchers with rich and unique responses. Wilson (2013) provided 28 children in Wisconsin, USA, with cameras and training in safety, ethics and the research process to record their afterschool outdoor play spaces. She found it a uniquely accessible method for participation and an effective way to gain insight into the deeper meanings behind the researched themes.

Tregaskis (2004), Von Benzon (2010) and Horton (2017) found that the benefits and barriers around accessing nature perceived by those living with disability or raising a child with a disability were broader than those who did not have a disability. Based on this evidence, Photovoice – a method that privileges the voices of those with lived experience – was judged to offer a rich and targeted response to the research questions and so was employed for this purpose.

Participants and data collection

Purposive sampling was used to recruit participants. Invitations were sent to parents of school-aged children diagnosed with ASC through existing online support groups for such parents in Australia, identified through searching online using the keywords "autism" "parent support group" "Australia." Participants were asked to confirm on the consent form that their children had been diagnosed with ASC by a health professional and were aged between five and 13. Parents of older children were excluded due to concerns about photographic consent, and those with younger children excluded to ensure confirmation of ASC diagnosis. A narrow age range was selected in order to increase the likelihood that participants had similar recent experiential knowledge of parenting children with ASC (Palibroda et al. 2009). In this study, all children were aged between five and 10 years.

All participants had existing Facebook accounts and a device such as a phone or digital camera to take their own photos. This was ensured by seeking interest from members of existing Facebook-based parent support groups. While interest was shown by both fathers and mothers from a number of different Facebook-based support groups, all three participants were mothers from the same Facebook group based in an area on the outskirts of Sydney, Australia. The three mothers, who chose the pseudonyms 'Jayne', 'Sarah' and 'Kristi' for this study, were given information about the study and agreed to participate as they wanted to share their perspectives. They were invited to join a secret Facebook group moderated by the researcher. Facebook groups may be public, private, or secret. A secret Facebook group cannot be googled and cannot be viewed by those other than members. Members cannot 'share' posts or photographs outside the secret group. The Facebook group was open for a month to give parents adequate opportunity to participate.

Before beginning data collection, information about Photovoice, ethics, appropriate online behaviour and online privacy was provided via Facebook posts, with

opportunity for discussion. The "big ideas" of the project, that is the first two research questions, were introduced to the participants for reflection. The use of "big ideas" as a way of focusing on key concepts comes from the field of education (McTighe et al. 2004) and has been used in participatory research as a way of simplifying abstract concepts (Redman-MacLaren et al. 2014).An additional question regarding method was asked in order to explore the Photovoice process itself: "Do parents feel the Photovoice process helped them gain insight into their own views?"

As part of the Photovoice process, the participants were asked to take up to ten photographs on their own devices based on their reflections around the "big ideas." They were encouraged to upload each photograph as taken and to append the story of the picture, linking it to the "big ideas" being researched. The two participants who had not storied a particular photograph (because taken by the other participant) were encouraged to critically analyse their fellow participant's photograph by thinking about the "big ideas" and posting their comments underneath the original photographer's remarks. Participants were also asked to select the photographs they believed best represented the "big ideas" as they saw them. The researcher scaffolded this process by asking clarifying questions, "bumping" posts (that is, writing a comment to ensure a post was seen) and "tagging" participants (that is, selecting their names so that Facebook alerts them to the post). Facebook polls were used to assist participants in selecting themes which they felt were most important.

After the photographs had been taken and discussed, participants were invited to participate in a semi-structured interview, based on the research questions. These interviews were conducted using Facebook messenger, where researcher and participant typed responses to one another. The interviews were an opportunity to focus on the additional method question, regarding the participant's perception of the Photovoice process itself, and to select a particular photograph which best represented the barriers and benefits for the participant. Participants were also invited to share their ideas with the wider community. In Photovoice this is traditionally done using a photographic exhibition, but in this project, the participants chose instead to start a new Facebook group to open the discussion to a broader group of parents and professionals.

Each participant was asked about their experiences of engaging through Photovoice. Jayne felt that the visual format of Photovoice fitted her learning style; she focused on what she had learned by using photographs, adding "yes, because I'm a visual learner. It was nice to talk and bounce ideas." This reflects the findings of Adams et al. (2017) who found Photovoice helped their participants make sense of the research questions. Kristi found that sharing photos and discussions validated her own experiences, which echoes the findings of Olibris (2015) who found her participants were able to critically reflect on the research questions through the process of Photovoice. "Initially I found myself looking for photos that I thought would represent my own thoughts on the benefits of nature time," Kristi wrote; "and then progressively found myself looking for benefits or barriers in my existing photos. It was interesting to see others' photos and thoughts on what they saw and was given validation for a few of my own thoughts." Jayne responded with the things she had learned about benefits and barriers from the project, but added, "as fully as we could in a month, I would have loved for this to be an ongoing study." All three participants showed interest in starting a new Facebook group to share their ideas with the broader community. This group was begun after the completion of the project, administered by the three participants, and opened up to interested parents and professionals.

It is important to note that participation in the study was limited to those able to invest a significant amount of time for online discussion as well as an interview. Due to this limitation, only three parents were able to participate. The need for access to Facebook also limited those able to participate, and led to the discussion flowing less freely than expected, even though it benefited participants by being a flexible, accessible and familiar space. The choice to use Facebook limited participants to adults, which means that children's voices were not represented in this study.

In summary, three data collection methods were included in the study, not including the photographs themselves, which were prompts for further inquiry. The first form of data collected was a record of the written comments which the participants added to the posted photographs. The second form of data was the use of Facebook polls, where participants could select the themes they felt were most important. The third form of data was the narrative from semi-structured interviews conducted via Facebook messenger. The aim of the three methods, where user-elicited photographs acted as prompts, was to increase insight and reflection around the themes of benefits and barriers to wild nature, and to gain access to the perceptions of the participants in their own words.

Ethical considerations

This study adopted the guidelines of the National Health and Medical Research Council in Australia (2007), and approval was obtained via the Charles Sturt University ethics committee. All participants were given detailed information about the study, and gave consent by appending their signatures to a consent form, and returning it to the researcher, before invitation to the secret Facebook group; the decision of the participant to join the Facebook group by clicking 'join group' provided another level of consent.

Photovoice has unique ethical considerations due to the use of photographs (Wang and Redwood-Jones 2001). Participants were given specific information about the ethics of Photovoice before the project began. They were provided with forms and guidance around seeking consent from photographic subjects and were encouraged to gain assent from their children before participating, and before taking or uploading photographs of them. Participants used their real names in the Facebook group, but were advised before joining the group that they could start fresh accounts with false names for use in the group if they chose. Identifying information such as names and other details were removed from the findings; photographs were not reproduced in the final report. The Facebook group was closed once the study had finished, and the photographs remained the property of the photographers.

Data analysis

Participants uploaded sixteen photographs in total to the Facebook group. The photographs included places visited regularly, such as a local river, and places visited on a special trip, such as a national park. After the participants indicated saturation by asking the researcher whether any further photographs needed to be taken, a Facebook-based poll was created. This poll listed the themes which arose from the initial researcher-led analysis of the participant comments. From the listed themes, each participant was asked to select two themes which represented the way access to wild nature benefited their children, along with two themes which

represented barriers to accessing nature for their children. Altogether four themes which represented the benefits of accessing nature, and four themes which represented barriers to accessing nature, were selected from the Facebook poll, and these selections prompted further discussion between participants.

Thus data analysis included both participant-led thematic analysis, where the participants categorised the photographs by themes and selected the themes that the group agreed felt most important, and researcher-led thematic analysis which followed thematic coding (Braun and Clarke 2006). Responses from both the online focus group and the semi-structured interviews were read carefully for meaning, and then examined according to the themes or recurring patterns of ideas, which evolved from the narrative. In this case, the narrative comprised of analyses of photographs by the photographer and by the other participants and the semi-structured interviews. The participants were involved in elucidating themes, both through their comments, and through an online Facebook-based poll where each participant chose which two of the benefits and barriers were most important. At the conclusion of the project, participants were given the opportunity to read and comment on the draft report of the project, ensuring they supported the summary and interpretation before it was finalised.

Results and discussion

This section presents the eight themes generated through the data analysis. Detailed first are the four themes which spoke to the benefits of accessing nature: wild nature supports the child's deep interests, wild nature helps the child cope with change, wild nature helps the child be more creative and imaginative, and wild nature is calming to the child. Following this are the four themes which represented barriers to accessing nature: being too busy with appointments to access wild nature, sensory challenges acting as a barrier to wild nature, balancing needs of siblings as a barrier to wild nature, and the stress of daily life as a barrier to wild nature.

Benefits of accessing wild nature

Wild nature supports the child's deep interests Five of the sixteen photographs related to a child's deep interest, that is an interest that is long-lasting and self-initiated. There was discussion by all participants surrounding this. Two of the participants selected this as the chief benefit for their child, with one participant selecting one of the photographs representing this as the most important photograph in the project for her. Interests included Australian history, rocks, birdwatching, movement, and focusing on tiny details such as insects and leaf patterns. As Jayne commented, "there's not a day that goes by that he's not grabbing rocks, sticks, leaves or bark." While Kristi shared that, "our son is an avid bird watcher. He can sit for hours filming, photographing and documenting them."

When Jayne put up a series of photographs of time down at the river, she listed all the sensory and movement activities that her children sought out. These were, "balance and coordination, experimenting, letting off energy, sensory touching water sticks bark possibly a spider's web."

The diversity of the possibilities in nature were notable throughout the Facebook discussion; there were references to native creatures, plants, rocks and insects. Jayne noticed that while one child "likes big animals like birds, kangaroos etc," her other child, "likes lizards and bugs and stick insects, ants and butterflies."

The child-led aspect of access to nature, with both the time and space to explore, appealed to the participants. "I think freedom and space are the two biggest benefits I see," Kristi shared. "Freedom to be himself in his own space to discover what he needs to in his own time."

There is now a growing body of literature which argues that children with ASC enjoy better outcomes when interests are supported (Gunn and Delafield-Butt 2016). Blake et al. (2018) reported that time in nature supported children's deep interest in movement in a way that other settings could not. While it is important not to over-generalise the responses of a small number of participants, it was clear that the ability to focus on their deep interests was one of the biggest benefits for parents in this study.

Wild nature helps the child cope with change Three of the photographs, those related to sensory experiences, were considered both benefits and barriers. Two of the participants selected the ability of wild nature to help a child cope with change as the chief benefit for their child, and it was also raised again in the interviews. Sarah commented on "the benefits of exposure to situations, seeing the progression of kids wary of the elements to begin with, then embracing them as time went on."

This sense that a child might move from anxiety to enjoyment through exposure was echoed by the other participants, with Jayne sharing that, "today the whole family are attempting a family afternoon enjoying Gods creation down at the river mainly to let my child's assistance dog get exercise but in doing so we are desensitising them to the sensory side."

For Kristi, it was only through discussion that she noticed this in her own photographs, pointing out that, "I can see [in this photograph] that he is doing all he can to involve himself in an activity he is passionate about without having to actually touch the dirt!!! So adapting to discomfort is a huge benefit that arises from a recognised barrier."

The challenge of inflexibility and difficulty coping with change for people with ASC is an area which has been discussed extensively in the literature (Geurts et al. 2009; Van de Cruys et al. 2014). Researchers such as Larson (2006) and Chang and Chang (2010) found parents reporting sensory sensitivities becoming less of a barrier for their children with repeated exposure to nature. In this current study, participants reported that nature could encourage more flexible, adaptive behaviour in their children by linking preferred activities (the child's interests) with a non-preferred environment (sandy or dirty).

Wild nature helps the child be more creative and imaginative Two of the photographs documented a child with ASC building a "rock-castle" (because he had no bucket to build a sand-castle). Another photograph showed siblings making holes in the sand together, initiating and imitating one another. Jayne selected this as one of the chief benefits of spending time in nature, sharing that "he couldn't make one without the sand castle bucket so he used rocks and made a rock castle then the water was going near the rock castle so they made a water thingy which I, Mum, renamed a moat."

This benefit has not been highlighted previously in the literature for children with ASC, even though children with ASC typically struggle with creative and imaginative play (Craig and Baron-Cohen 1999). Von Benzon (2010) reported that children with learning disabilities including ASC were less likely to be offered opportunities by schools and groups to play informally and imaginatively outdoors than typically-developing children, and more likely to be given access to nature under controlled conditions, limiting their opportunities to play freely and creatively.

Wild nature is calming to the child The three participants mentioned the natural calm and quietness of time in nature, and discussion was had about the ability of children to focus better in that environment, with two of the photographs showing the child completely focused and intent on an activity. One of the participants selected this as one of the chief benefits of accessing nature. The quality of "calmness" was often linked to better focus with Kristi commenting, "he tunes in well when there is something small with movement to focus on amidst the usual calm of being 'outside'", and Sarah sharing, "he was so calm and focused while holding the lizard today." Jayne stated that "just pottering around is calming and engaging" for her child; while Kristi wrote that "I see that everyday life is so busy and timetabled and rushed and overwhelming for him and being outside rewrites the pace and clears the space so he can 'be'."

The relationship between calmness and attention for the individual has been widely documented (Robinson et al. 2013) and is the basis of the attention restoration theory of nature (Kaplan 1995). Participants found that children were able to explore their deep interests in the calm environment of wild nature and were able to cope with the stress of adapting their behaviour to the environment more easily than would have been expected. This finding reflects the observations of Van den Berg and Van den Berg (2011), and of teachers interviewed by Blakesley et al. (2013) who noticed children who spent time in natural settings were calmer and less aggressive. It is important to note that this is the perception of calmness as reported by the parent participants; and without access to the children's voices it is impossible to know whether the children are seeming calm or actually feeling calm (Li et al. 2019).

Barriers to wild nature

Being too busy with appointments to access wild nature This barrier was selected by all three participants as the chief barrier to spending time in wild nature. A photograph was uploaded representing this barrier by Jayne and was selected as the chief photograph which represented her thoughts on the project. This was a compilation of several logos representing the different therapists which needed to be seen in a week with the comment: "running 2 ASC kids back and forth." The two other participants expressed their understanding of this phenomenon through the comment "definitely" and clicking "like."

This barrier was discussed in interview with Sarah who pointed out that, "it would be amazing if we could record ongoing sessions with recently diagnosed children to help support the theory that therapy in conjunction with exposure to wild nature is more beneficial than therapy in a controlled and sterile environment."

In this comment, the phrase "controlled and sterile environment" is contrasted with the phrase "wild nature" (which may have been chosen to reflect the project's name). It was not just the time spent in appointments that appeared to be the barrier, but the fact that they were spent in an environment less unpredictable than everyday life. While Brodin (2009) found that nature can be an inclusive environment for children with ASC, therapy sessions may instead exclude the child from the community. Mayton et al. (2014) in their study on therapies for children in the US found that children with ASC were subjected to more intrusive interventions than children with other diagnoses, including therapies which were restrictive or involved loss of control.

Sensory challenges acting as a barrier to wild nature Three of the sixteen photographs represented sensory challenges. One included a sandy foot being carefully washed with a jar of water, with the comment by Jayne that: "the challenge of sand on the feet is real." This photograph was later selected by Jayne as the one which best represented both benefits and barriers, and she added, "this represents the steps we take to actually push past the sensory barriers with getting out in nature as sensory can be a big reason."

The three participants recognised that sensory challenges were more complex than just being a barrier. The participants did "avoid some situations," Jayne shared; "like long grass with shorts is too overwhelming." Sarah commented on "sensory overload from too many competing sounds in the bush, too many people occupying a space (lookout sights, canopy trails etc)."

However, in most cases, participants chose not to avoid sensory challenges but to use them as opportunities to extend the child's flexibility and adaptive behaviour. "I've been looking at this pic and I didn't realise that textures might be a barrier for my guy but have a look at this adapted stance!!" Kristi commented. "I have a photo of my n/t [neurotypical] daughter doing the same thing and she is bum down hands in the dirt no dramas at all," she went on. "I can see that he is doing all he can to involve himself in an activity he is passionate about without having to actually touch the dirt!!! So adapting to discomfort is a huge benefit that arises from a recognised barrier." Kristi also wrote that, "food aversion and the need to keep up calories while participating in outdoor activity has taken quite a bit of work for us. He is now at a point where he knuckles through somehow [although] I don't know how I'd go eating something that was different to what I expected."

The sensory challenges which form an individual barrier discussed by all participants reflect an ongoing discussion in the literature about the challenge of sensory needs on family life and recreation (Bagby et al. 2012). In most cases, sensory needs were another challenge to be accommodated by parents who provided fresh clothes, a water jar, or simply patience to support the child through a difficult experience; however sensory sensitivity did mean extra enjoyment of some features of nature, especially around deep interests such as movement (see Blake et al. 2018).

Balancing needs of siblings as a barrier to wild nature All three mothers had more than one child, and two families had two children diagnosed with ASC. Several photographs were posted of multiple children playing in nature. "Two ASC and assistance dog with no back up for an hour after school and preschool I think we all did amazing," Jayne commented. Sarah shared that she had "one child who gets over excited very easily, constantly runs ahead and trips or runs into something then we have a half hour

meltdown where noone moves until we can calm him down, the other who gets so caught up in the tiny details of everything that she is constantly lagging behind and melting down because she wants to stop and collect every leaf, twig, bug, etc., she sees." Jayne also wrote that she had "one child flat chat, the other intricate details. One will stop and look at the birds or animals the other oblivious and stomping around scares the wildlife away and meltdown begins."

Participants commented on the challenge of balancing different needs in nature with the different needs of their children. This barrier has not been previously raised in the literature surrounding autism and the outdoors, even though a child with an older sibling with ASC is 18% more likely to have ASC (Ozonoff et al. 2011), meaning many families will be raising more than one child with ASC. The child with ASC is rarely alone in nature; they are usually part of a group or family and will continue to have the same challenges adapting to others' perspectives, while needing extra support to interact cooperatively (Shields and Synnot 2016).

The stress of daily life as a barrier to wild nature One participant raised this as her chief barrier, relating it to the former barrier of being too busy with appointments, but seeing it as broader than "not enough time." Kristi wrote, "I'm not sure it comes under 'appointment busy-ness' or sensory needs – but just exhaustion my guy has after everything life is – although time in nature is very usually therapeutic sometimes we just can't move from home and need to rest." Jayne agreed and shared that, "yes some days which will result in not going to school or preschool even," and Sarah agreed, "completely; the constant stress of everyday life with 2 ASC kids is both physically and mentally exhausting."

While there is a wealth of research on the exhaustion of parents or teachers of children with ASC (e.g. Giallo et al. 2013; Lecavalier et al. 2006), there is little focusing on the exhaustion of the child with ASC who needs to work extra hard to navigate the challenges of each day; often challenges which are placed upon the child by the community.

Conclusion

This study aimed to explore the perspectives of parents of children with autism accessing wild nature. Three mothers shared, using Photovoice, how time in wild nature supported their children's deep interests, helped them adapt to change, supported their creative and imaginative play, and calmed them. They also identified barriers to accessing nature, including being too busy with therapy appointments, balancing the needs of siblings with ASC, sensory challenges, and the exhaustion of daily life. These mothers reported that the use of Photovoice helped them gain insight into their own perspectives. This method allowed the responses of the participants and their conversations to guide the narrative and give focus to the analysis.

Despite the small participant group, the findings of this study could be considered in order to inform future research. Larger-scale studies researching the unique perspectives of parents of children with ASC concerning wild nature would enable generalisations to be made. Research which included a wider range of participants, such as

parents of older or younger children, would support development of broader understanding. Comparing parental perceptions of benefits and barriers with experimental data would also add insights. Currently there is limited research in the area of wild nature and ASC. Research that explored areas such as the relationship between nature and creativity in ASC, the restorative aspect of nature for children with ASC and their families, and nature and the ability to adapt to change could provide interesting insights, especially as children with ASC may typically struggle with creative and imaginative play (Craig and Baron-Cohen 1999), live with high levels of stress (Baron et al. 2006) and struggle with adapting to change (Van de Cruys et al. 2014). Finally, exploring the long-term effects of participatory methods in relation to social change in the area of ASC research could provide data to support positive change for children with ASC and their families.

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Compliance with ethical standards

Conflict of interest No potential conflict of interest is reported.

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