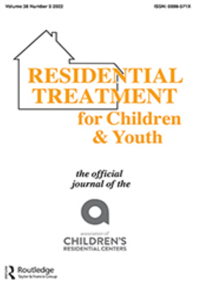

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RESEARCH ARTICLE

Staff Perspectives on the Targeted Incorporation of nature-based Interventions for Children and Youth at a Residential Treatment Facility

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ABSTRACT
Nature-based interventions that incorporate animals and the natural environment in therapeutic settings are increasingly common. However, there is a gap in understanding the intervention qualities that may facilitate treatment goals. To help answer this question, we analyzed interviews of 78 staff members at a residential and day treatment school that is an established leader in nature-based interventions. When reflecting on interventions, staff highlighted qualities such as delayed or immediate gratification, sense of safety or fear, and grounding or stimulation. Interventions were often described as offering qualities which could support more than one treatment goal. For example, a dog might provide immediate gratification by approaching a quietly seated student, or their presence could help a student feel safer in therapy. Each quality also displayed a subjective component: while one student might find time with horses grounding, another could benefit from the opportunity to manage the stimulation experienced by the horse's smells and sounds. Further research into understanding qualities of nature-based interventions and how practitioners might elicit them from a variety of intervention types is warranted.

KEYWORDS
Animal-assisted therapy; nature-based interventions; green care; children and youth

Introduction

Developmental disorders are characterized by atypical central nervous system development that results in differences in when and how a child plays, learns, speaks, acts, and moves at standardized milestones (Malafaia et al., 2020; Zablotsky et al., 2019). These include autism spectrum disorder, attention deficit/hyperactivity disorder, and learning disorders according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) definition of developmental disorders (American Psychiatric Association, 2013). Developmental disorders affect up to 17% of children and youth ages 3–17 in the U.S., and these disorders commonly co-occur with mental health disorders (Salazar et al., 2015; Zablotsky et al., 2019). One intervention approach, nature-based interventions, employs the "intentional, mutually

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influential exchanges between animals, plants, and/or nature," (Flynn et al., 2020, p. 1) represents a promising treatment for children and youth with developmental disorders when used as an adjunct to standard treatment (Shanahan et al., 2019; Shotwell & Wagner, 2019).

Recent research has observed increases in self-esteem, self-efficacy, resilience, and academic and cognitive performance among children and youth, and people in institutional settings, in association with nature-based interventions (Moeller et al., 2018; Mygind et al., 2019). These skills are particularly important to cultivate among children and youth with developmental disorders. For example, low self-esteem and self-efficacy are hallmarks of generalized anxiety disorder, a very frequent co-occurring diagnosis in children with developmental disorders (Salazar et al., 2015). Animal-assisted interventions with children with developmental disorders have also been shown to improve social interaction and communication, with which these children often struggle (Dimolareva & Dunn, 2020; Liss et al., 2001). The potential for nature-based interventions to directly address the challenges faced by children and youth with co-occurring developmental and psychiatric disorders implores further research into how both structured and unstructured interactions between children and animals or nature can be facilitated by practitioners who use nature-based interventions.

Nature-based interventions have been incorporated in many settings including institutional, educational, and therapeutic contexts, but best practices for implementation of these interventions still need to be identified (Balleurka et al., 2014; Brelsford et al., 2017; Moeller et al., 2018). While a growing body of research has identified outcomes associated with specific types of nature-based interventions, such as horseback riding or gardening (e.g., Davis et al., 2015; Flynn et al., 2019), it often does not control for species of animal or type of nature when measuring efficacy of the intervention (Santaniello et al., 2020). Indeed, the "heterogeneity … [of] animals participating in these interventions" has been identified as a challenge to understanding and optimizing animal-assisted interventions (J. Serpell et al., 2017, p. 223). The inclusion of other nature-based interventions, such as horticulture therapy or nature hikes, further complicates analysis.

There remains a need for greater understanding of interventions that incorporate different types of animals or nature. Such research would help determine whether different nature-based interventions might promote distinct outcomes for children with developmental disorders and what elements of different forms of nature-based interventions may support associated health and learning outcomes. Further, children experiencing developmental disorders have unique symptom profiles that can vary greatly by individuals and across diagnoses and, thus, may benefit differently from nature-based interventions that incorporate various types of animals, plants, or natural environment, or employ different intervention structures. Identifying how staff conceptualize various interventions and their relationships with treatment goals is critical to supporting effective intervention incorporation.

Understanding staff perceptions of different intervention types serves an additional practical consideration: one of the most commonly cited barriers to incorporating nature-based interventions more widely is their cost and ease of access (Dimolareva & Dunn, 2020; Lopez-Cepero, 2020; Shanahan et al., 2019). By understanding qualities that can support specific treatment goals, professionals who wish to utilize nature-based interventions will be better equipped to make practical and cost-effective selections.

The reported study focused on insights from practitioners at Green Chimneys, a residential treatment and special education school that "applies a positive youth development (PYD) treatment approach within a unique context that thoughtfully integrates nature – including animals, plants, and the natural environment – throughout its campus" (Morris et al., 2019, p. 14). By learning how these experienced staff reflect on the impacts observed from their various nature-based interventions, other practitioners can gain insights into how they can thoughtfully implement interventions with the resources they have available.

Method

Participants

Semi-structured interviews were conducted at Green Chimneys, a New York State-approved private school for special education and psychological treatment. The Green Chimneys campus includes an array of nature-based interventions, including programs with equines, dogs, farm animals, wildlife, and gardens. These programs are often referred to collectively as "the farm," with staff who work on any of these programs referred to as farm staff. There are over 300 domesticated farm and wildlife animals that live on the Green Chimneys campus. Mental health staff at Green Chimneys "receive training in Therapeutic Crisis Intervention, as well as proper techniques to engage safely and effectively with various animals, plant species, and natural settings" (Morris et al., 2019, p. 18). Youth learn to interact with nature in a wide variety of contexts on the campus and participate in providing the animals and plants with daily care. Nature-based interventions are incorporated into the educational and treatment milieu at Green Chimneys to enhance experiential learning for children and youth. This includes incorporating animals into individual and group therapy sessions and attending classes in the farm animal, equine, garden, and wildlife program areas as part of students' weekly class schedules. Additionally, protocols are in place for staff to make nature-based interventions available to youth on an as-needed basis.

Participants were recruited in collaboration with Green Chimneys' staff using e-mails and direct outreach from the research team that detailed the purpose of the study. Interested staff met with researchers on the school's campus. The sample size (*N* = *78)* was chosen to allow for meaningful representation from farm staff (*n* = 20), clinicians (*n* = 23), teachers (*n* = 18), and residential staff (*n* = 17) and to reach concept saturation.

Inclusion criteria required that the individual be employed by Green Chimneys as a staff member who incorporated nature-based interventions into their work with youth between the ages of 6 and 19 years with emotional disturbances, learning disabilities, and/or other mental health impairments.

Data Collection Procedures

Researchers explained the purpose of the study to each staff member according to the University of Denver IRB-approved recruitment script (DU IRB Protocol 1198678–2) prior to interviewing. Each participant was then given the opportunity to ask questions about the study before signing the consent form and receiving a $10 incentive. Participants answered a brief demographic survey and completed an approximately 30-minute interview, which was conducted either in the participant's office or another private workspace to encourage participants to speak openly. The interviews began with the broad, open-ended question: "How have you seen kids be impacted by the nature-based interventions at Green Chimneys?" This initial question made the assumption that nature-based interventions had some degree of impact on children and youth, and follow-up prompts were used to explore the possibility that they had no impact on children and youth (see below). The series of questions were intended to gather broad insights into staff's understandings of the nature-based interventions at Green Chimneys.

To collect as much narrative data as possible, interviewees were asked their views on the immediate and long-term outcomes of student participation in nature-based interventions and were further prompted with open-ended questions including:

1. Have you seen instances when youth weren't impacted by farm or nature-based programs or were negatively impacted? If so, please describe.
2. Have you seen youth benefit from farm or nature-based programs? If so, please describe.

Staff were also asked questions specific to their fields of expertise. For example, teachers were asked "Did you notice students learning anything specific from nature-based programs and, if so, in what ways?" and clinicians were asked "Did you notice any specific benefits to youth from incorporation of animals into therapy and, if so, in what ways?"

To reduce researcher bias, interviewers used open-ended prompts, avoided leading questions, and asked about positive, negative, and no impacts. This allowed for greater range, depth, and nuance to arise from subsequent analysis of staff perspectives and encouraged participants to speak about features of children and youth outcomes that they believe to be most salient. Interviews were audio recorded, stored on password-protected devices, and later transcribed by one of six graduate research assistants according to a standard protocol. To ensure accuracy, a second researcher read through the transcript while listening to the recorded interview and made corrections when there was a discrepancy between the transcript and the recording.

Analysis

While the initial research questions were intended to elicit general descriptions of experiences with nature-based interventions, this paper analyzed responses to uncover the intervention qualities that frequently emerged across staff groups without direct prompting. Data were analyzed by two research team members using a general inductive approach (Thomas, 2006). This process included:

1. Cleaning data and placing all files in a common format
2. Reading the text in detail to gain familiarity with its content and themes
3. Creating and defining categories or themes
4. Coding relevant text by grouping similar concepts into themes and subthemes
5. Revising and refining themes and subthemes

This iterative process anticipates that multiple rounds of analysis of the text will occur, and that the codebook will be continually updated and revised as new insights and themes emerge. To enhance validity and trustworthiness, three research team members – the two initial coders and an additional researcher with expertise in nature-based interventions at Green Chimneys – met weekly to discuss items that were coded under each theme, check for agreement, and further clarify themes.

Results

In total, 78 Green Chimneys staff members participated in these interviews. Participants had a range of two months to 39 years of experience working at Green Chimneys. See, Table 1 for more details regarding participant characteristics.

Table 1. Participant demographics.

Variable	N (%)
Ethnicity	
Asian/Pacific Islander	2 (2%)
Latinx	4 (5%)
Black	3 (4%)
White	60 (77%)
Biracial or Multiracial	3 (4%)
Did not self identify	6 (8%)
Sex	
Female	52 (67%)
Male	26 (33%)
Staff Role	
Farm Staff	20 (26%)
Clinicians	23 (29%)
Teachers	18 (23%)
Residential Staff	17 (22%)

In line with the process described above, the researchers initially coded the interviews based on the particular type of nature-based interventions used, with categories such as "dogs," "garden/greenhouse," and "horses." However, upon analysis of these categories and discussion with two additional research team members, the researchers unanimously agreed that these groupings did not lead to significant clarity or insights regarding how staff were conceptualizing various nature-based interventions. Instead, it appeared that staff were selecting interventions based on qualities that superseded the researchers' initial categorizations. Therefore, the team created a new codebook utilizing themes and subthemes that centered on intervention qualities highlighted by staff and recorded the interviews based on those qualities.

Five themes emerged during analysis: availability of physical interactions, gratification, emotional experience elicited, stimulation, and familiarity. Notably, while each of these themes contained two binary subthemes, the qualities discussed existed on a spectrum. For example, within the theme of emotional experience elicited, both fear and safety were discussed. However, a student might initially experience fear at the sight of a snake but gradually become more comfortable until interacting with that same snake provided a sense of safety. Therapeutic engagement could occur at any point along that quality spectrum. An elaboration on themes and subthemes, with representative quotes, follows.

Availability of Physical Interactions

A majority of staff members noted the benefits of the easy physical access to most of Green Chimney's nature-based interventions. The ease of access to interventions offered several advantages, including providing opportunities for hands-on learning, regulation through physical movement, and physical comfort. Several staff also described the distinct opportunities facilitated by interventions that were physically inaccessible and required an investment of time or energy before they could be directly interacted with (i.e., teaching children and youth to observe the body language of a shy animal, then slowly building a relationship before physical touch was acceptable.) In particular, these interventions often provided opportunities for children and youth to improve their self-regulation and social skills.

Hands on

Many children and youth seemed to benefit from the physically accessible learning opportunities provided by nature-based interventions. Staff shared stories of children and youth who appeared to struggle in traditional classroom settings, but who thrived academically when their learning was more hands-on. For example, one student who was described as "not a sit in your chair and learn style learner" would "mentor the little kids in the garden," where he could "figure out what vegetables can be planted next to each other, so they help each other . . . He's into the science of it all, really an amazing kid." Several staff discussed children and youth who were "difficult" or who "no one could really get through to" in school who were able to learn "by doing . . . because they're not just sitting, listening, and daydreaming" on the farm. This appeared to be particularly common for children and youth who "struggle[d] to sit still in class."

In addition to appearing to benefit from hands-on learning, many children and youth seemed to benefit from the farm's opportunities for physical movement. Staff observed that many children and youth "regulate[d] through . . . manual work," which could help them "focus and give you their best selves." As one staff member reflected, "when your hands are busy, you're not as focused on your internal [problems] – especially if you're doing something that you really like."

Children and youth seemed to benefit from the physical affection that, in many cases, was only accessible to them from non-human animals. Often, children and youth had limited contact with family and friends who could appropriately offer physical comfort and staff had "physical barriers that [they] have to maintain as an agency," which restricted their freedom to "physical[ly] comfort" children and youth.

Hands off

Although less frequently discussed, staff noted benefits from nature-based interventions that were less immediately or tactilely accessible. In particular, time with animals who required more careful physical interactions seemed to elicit positive attributes and skills of children and youth, who often "roughhous[ed] with each other" but became "much more caring" when around animals, for whom they were seen as having sincere concern. Staff noticed that children and youth seemed especially motivated to learn self-regulation skills in order to be able to approach animals who would otherwise be inaccessible:

> *You can't approach [farm animals] crying and in tears or cursing because you're mad at something. You have to go in [to the interaction] at a pretty calm level: even if you're upset on the inside, you can't show that to the animals, because they'll see that.*

Staff frequently discussed incorporating into interventions shy or sensitive animals who could provide immediate feedback about the impact of a person's behavior through the animal's body language. They observed that this could help children and youth become more aware of their physical mannerisms and motivate children and youth to appropriately interact with both animals and people. One teacher recalled explaining to a child:

> *"You remember when you're with the dog, you don't want to yell because then she feels nervous and she kind of walks away? It's kind of the same thing, buddy. If you're yelling at the next person, you can be right but they're not going to hear you because they're just focusing on how loud your voice is." So, there's these little, small lessons that I feel translate into bigger life lessons.*

Gratification

Another attribute of nature-based resources that was commonly considered by staff was the spectrum of immediate versus delayed gratification. Both types of experience could be accessed through nature-based interventions, and each offered particular therapeutic opportunities.

Immediate Gratification

Many children and youth seemed to benefit from realizing that if they improved their behaviors, an animal might respond immediately and positively. This was especially common with dogs, whom many teachers discussed involving in interventions in order to create learning opportunities that could reinforce desired classroom behaviors:

> *"Okay, a dog is coming. Remember the expectations." . . . They start to clean up, and then they sit in their seats, quietly. Like perfect little angels . . . They tell each other, remind each other, what they can and can't do. Then they will sit there, and they will have the dog come up to them . . . We'll give them the treats to feed the dog, if they're also doing a great job, so they get rewarded too.*

Many staff members shared that the opportunity for immediate, positive interactions with nature seemed to be uniquely motivating to children and youth. Children and youth who were previously "bounc[ing] off the wall" could immediately settle down when told that a dog "needs you to calm down so he can come to you." One motivating factor seemed to be that animals "could care less" if a student was previously "not doing any work in class" or had gotten in trouble that day. If a student was well-behaved in the moment, many animals would immediately reciprocate with affection.

Delayed Gratification

In contrast, the quality of delayed gratification offered by some nature-based interventions supported children and youth in developing skills such as "frustration tolerance," patience, and persistence. Discussions of the garden and greenhouse programs were particularly common in this subtheme:

> *[S]ometimes you're going to plant something and it's not going to grow . . . or it's going to grow and it's not going to bear fruit . . . And it's going to be OK and we're going to try again. I think that's something that's really unique that they can get from those programs.*

In other cases, the desire to spend time on the farm was itself a powerful motivator and source of delayed gratification:

> *[Y]ou have the option of, " . . . I'm going to make it through math and do my work because then after math I go to the farm. And I get to work with the horses, and I know I really want to do that. So, let me get through this subject."*

Staff often helped children and youth translate the patience they learned through the delayed gratification found on the farm to peer interactions:

> *I had a kid who came to the horse barn . . . and I told him, "You've got to take it slow, and we can give [the horse] treats. We can walk with him and talk with him." Then I remember seeing him in his dorm. He was new to that dorm, and he was trying to talk to everyone, and I'm like, "Remember how we take time with these things? Everyone's going to need their own time. Sometimes you can't make that friend right away, but when you take your time, who knows what can happen?"*

Emotional Experience Elicited

Green Chimney's nature-based interventions elicited a range of observed emotional experiences in youth, commonly either a sense of safety or one of fear. Both responses opened a door to potential therapeutic growth.

Safety

Many children and youth were slow to trust or develop positive relationships with other people due to a history of trauma or limited social skills. In contrast, these same individuals often seemed to experience a sense of safety while interacting with animals, in part because animals were perceived as "nonjudgmental":

> *They don't feel like the animal is trying to get anything from them. It's just the pure relationship. A kid doesn't have to act a certain way or perform a certain way. They feel like they could be themselves around the animals.*

The relative simplicity of interacting with animals also appeared valuable to children and youth who struggled to interact successfully with other people. "[A]nimals are a safer space to be yourself … There's less demands, there's less required of you except for maybe petting them or … [d]oing something you're comfortable with." One staff member reflected on why this type of undemanding; non-judgmental relationship wasn't always available from adults at Green Chimneys:

> *I don't like to know … what a child's backstory is. Why they're here. [But] for my own safety I have to know … Whether you like it or not, you're going in there judging … The animals aren't like that and the kid knows it, too … He knows and he goes, "Yeah, I'm going into [teacher's] class and she's not gonna like me because she probably read about me." … [W]hen they come [to the farm], they don't have that.*

In many cases, when children and youth entered Green Chimneys they were reluctant or unable to form close bonds with other people, but the sense of safety elicited by animals seemed to "repair … their ability to have a relationship." Over time, several staff members observed children and youth developing an ability to "look at their peers and their staff and say … 'Maybe I can have a relationship with you, too.'"

Fear

Many staff, particularly those who worked with horses or wildlife, discussed the power of working therapeutically with children and youths' fear responses to some nature-based encounters. These discussions were grounded in the recognition that respecting children and youths' boundaries and comfort level needed to be the first priority, with staff emphasizing "We don't force anything upon the kids." When children and youth were able to move at their own pace, many gradually developed greater comfort with what had previously frightened them. At other times, the staff would "move on," either to another interaction with the same animal (e.g., grooming rather than riding a horse), or to another part of the farm.

The process of overcoming fear often required children and youth to develop skills such as learning to "tak[e] a calming breath" and "be patient with themselves." Children and youths' efforts to develop these skills were often rewarded with "huge ego boost[s]":

> *They want to be able to play with [the animals] even if they're scared, terrified. "I'll try it" … They'll be shaking, but they're like, "No, no, no, I'm gonna try it." Once they're finished, "I held it." They have this joy on their face, like, "Oh my God, I'm so scared, but I'm holding it and I did it." I'm like, "You're doing a great job. I'm so proud of you."*

As children and youth learned to overcome their fears, they often began supporting others:

> *[W]e would have students who are really afraid of the dogs and … my other students would say, "That's okay. We'll take care of this." They explain about the dog's habits and so on. Its likes and dislikes … Some of them were amazingly good at reading the body language both of the dog and of the fearful student. If either one looked uncomfortable, then they would move back.*

As children and youth developed the ability to overcome their own fears and support others through the same process, staff helped them translate that sense of courage into other areas:

> *[R]emember when you were scared of the rat? Then you did it and you were proud of yourself, so how about you try this math problem because who knows, you can figure it out and you can be proud of yourself then, too … And they're like "Oh, I did it. I'm brave now."*

Stimulation

Just as both safety and fear responses could help progress children and youths' therapeutic goals, staff members reported positive benefits across the spectrum of grounding and stimulating aspects of children and youths' experiences with nature.

Grounding

In many cases, staff reported that spending time in nature helped focus and ground children and youth in the present moment and that this could help prevent behavior escalations and crises. Simply looking at animals or spending time doing "mindfulness walking" in nature was often enough to shift children and youths' outlooks and ability to self-regulate in the moment:

> *[O]ne student … was just not in a good space … So he requested a walk to see the horses … [J]ust standing there and looking out to see them, it was heaven to him. He felt at home, and the rest of the day he was fine. Absolutely fine.*

Although several staff members reported stories of children and youth being "snapped out of crisis" when they interacted with an animal, they emphasized that due to safety concerns they avoided putting children and youth "in high-crisis mode" in direct contact with animals. Notably, no staff members reported any children, youth, or animals being harmed when a student was in crisis on the farm, despite being asked about any negative impacts of the school's nature-based interventions.

Interactions with nature also seemed to calm staff members and ground them in the present moment, which in turn led to benefits for children and youth:

> *[H]aving access to the animals and the outdoors has a therapeutic impact on the people that work here, too . . . I think that people are more regulated. And happier. They're more able to interact more peacefully with students who really have some difficulties.*

Stimulating

Although it could initially be challenging, many children and youth also seemed to benefit from the ways that the farm could be intense or even "overwhelming" to their senses, due to factors such as "the dirt, the smells, the noise, the weather." Many Green Chimneys children and youth "have those sensory issues," which could cause them to struggle in a variety of environments, including the cafeteria, dorms, and classrooms.

Despite the initial sensory obstacles, most children and youth wanted to spend time at the farm, and thus they were motivated to take "baby steps" to "acclimate" and "get used to being out of their comfort zone" so that the farm could become more accessible to them. Staff reflected that, over time, this could help children and youth realize that "even when they are frustrated or stressed by an environment, they can still get through it." Even staff who initially discussed the stimulating aspects of the farm as a negative often identified positive factors:

> *I worked with a lot of the spectrum kids, and some of them just couldn't stand the smells or the noises, it was just sensory overload . . . But we were able to desensitize and get them to a point where they could tolerate a farm class . . . So in that sense, it was helpful because they had to learn coping strategies to deal with things that they weren't comfortable with.*

Familiarity

Staff reported benefits of both familiar and novel aspects of children and youths' interactions with nature.

Familiar

Several staff members highlighted dogs' ability to provide the dorms with a "homey feeling" and help normalize the setting, particularly for youth who had pets at home. This was seen as especially valuable to children and youth who struggled with adjusting to life in a residential program. Even nonresidential children and youth could benefit from being around familiar animals, however. For example, one clinician discussed a student who had a beloved dog at home. Whenever he was with a dog at Green Chimneys, "it's a reminder of home and his energy will go up. He will be able to last longer in [a therapy] session, he'll be more willing to engage and be more able to push through things where he would have usually given up."

The benefits of spending time with familiar animals were not limited to dogs. Many children and youth developed familiarity with other nature-based interventions over time, and staff reported that children and youth loved feeling knowledgeable and that they were “caregivers” for specific animals or plants. One student, for example, spent significant time with the school’s donkeys and:

> *. . . would naturally start telling me things about the donkeys like, “Oh, see how they come right up to me? They know me. They remember me” . . . That was a place where he felt really knowledgeable and wanted to share that knowledge with me. And I think that was part of the calming process for him because that was a place where he felt he was in control, where he felt he was an expert.*

Many children and youth seemed to thrive on “telling the staff or the other kids or those that they care about: their parents, people who are visiting” about the animals and plants at Green Chimneys. They seemed to enjoy feeling like “experts” due to the familiarity they had developed with those topics.

Novel

Children and youth also appeared to benefit from the opportunities for exploration and discovery that the farm offered:

> *There’s this intrinsic desire to go out and find new things and discover. And for our kids I think that it’s important to enable that sort of exploration, because oftentimes they’re used to strict rules and rigid structure . . . But to be able to remove them from that environment and discover something new is awesome. And their behavior represents that.*

This exploration also helped children and youth step outside of their comfort zones, which was perceived as particularly powerful because they often appeared to think that “they can’t do something because it looks a little difficult or it’s strange to them.” Opportunities to challenge those assumptions were particularly common in the garden, where many children and youth wanted to experiment with eating what they grew. This led them to try new snacks like kale chips, or to experiment with spices, which staff saw as “a fun way to build up confidence.”

Children and youth were also seen to benefit from working with novel or unusual animals. In one account, a student was taught to walk Green Chimneys’ camels and “it was really empowering because it gave him the sense that he was able to work with this animal that is so big and so unique and so special . . . [H]e knew this was a very special role and there weren’t that many students that were trusted with that.”

In addition to these more individualized opportunities, staff also discussed the ways that the novelty provided by Green Chimneys’ nature-based interventions could make children and youth more enthusiastic about being present at the school through their experiences on the farm:

> *There's also a healthy amount of surprise [at the farm]. Kids learn things here. They don't come in expecting to learn. I don't mean that we don't teach. I mean that they don't come in expecting to take notes or do homework. They come in and somebody's holding an owl, or there's a snake on the table.*

Discussion

The findings from this study incorporate the perspectives of staff at a residential and day treatment facility that is world renowned for its incorporation of nature-based interventions with children and youth. A unique aspect of the study is the inclusion of interview data collected from staff with a variety of backgrounds and specializations including education, residential care, and clinical mental health treatment. The field of human-animal-environment interaction has called for increased protocolization of interventions to compare efficacy and determine appropriate utilization (Fine, 2015). While protocolization of nature-based interventions contributes to replicability and ease of measurement, intervention protocols can be in tension with the need to adapt intervention strategies to the unique, and sometimes divergent, needs of clients and may decrease ecological validity by reducing the variability inherent to interventions provided in complex treatment settings (Wilson and Barker, 2003). This research illustrated that in this complex treatment setting, staff were less focused on animal or nature type and more guided by intervention qualities. This is in line with the outcomes of interviews with care farm participants and providers, which emphasize that the interactions of intervention qualities in a similar context led to positive outcomes for participants (Hassink et al., 2010).

Qualities of nature-based interventions that seemed to facilitate treatment goals for children and youth illustrated by staff fell into five thematic spectrums. These include: availability of physical interactions, gratification, emotional experience elicited, stimulation, and familiarity. Similar qualities have previously been highlighted through interviews with young adult students (Khalid et al., 2021). Analysis revealed that extensive familiarity with each intervention quality spectrum, in combination with awareness of the needs and preferences of any given child or youth, allowed for targeted nature-based intervention selection. The necessity for targeted intervention, which requires foundational knowledge of intervention qualities described by this research, has been emphasized by theoretical models describing human-animal interaction facilitated change (Gee et al., 2017).

Each quality spectrum described in this work represents narrative descriptions provided by staff. The benefit of conceptualizing these concepts as a spectrum is that staff emphasized the value of movement across the spectrum and the ability to support students' differing needs and goals. For example, the availability of physical interaction spectrum includes the subthemes of hands on and hands off.

For some children and youth, interacting with nature-based interventions in a hands-on manner allowed them to stay connected to their physical body or reconnect with reality after being dysregulated. Conversely, some children and youth appeared to benefit from a hands-off interaction with a sensitive or reserved animal. In this example, each child or youth benefited differently from unique qualities of each nature-based intervention. The combination of intervention qualities with the ability to customize the intervention in the moment was frequently described by staff. Flexibility in interventions has also been highlighted as a key element within nature-based interventions in interviews with participants with clinical depression (Pedersen et al., 2012). To illustrate movement across each quality spectrum, a student that has difficulty self-regulating may benefit from a nature-based intervention that is initially hands off. After the student has gained the skills to regulate themselves during a nature-based intervention, they might then transition to interactions that are hands-on. The findings suggest that access to a variety of nature-based interventions with diverse qualities is important to facilitating beneficial nature-based interventions for children and youth so that each individual can be provided with an intervention that matches their abilities to achieve individualized growth. The importance of considering specificity has also been found in other research on the impacts of animal-assisted interventions (Geldhof et al., 2021).

In tandem, staff described qualities that multiple types of nature-based interventions shared. For example, some children and youth may experience a feeling of safety during an intervention that incorporates a dog, whereas other children and youth may experience this feeling while taking a walk in nature or working in the garden. This suggests that staff may be able to select among a variety of nature-based interventions that have shared qualities to facilitate a particular treatment goal. This finding highlights that having a multitude of intervention types on hand is not always necessary to facilitating beneficial interactions, an argument that is bolstered by the overlapping, positive impacts observed across a variety of types of nature-based interventions in other research (Coventry et al., 2021; Overby et al., 2021; Taylor et al., 2022).

A third perspective that a majority of staff shared is that nature-based interventions regularly shift qualities based on context. It is essential to evaluate how the context is influencing the intervention as the qualities anticipated by the practitioner may not always be accessible. For example, animals may not always be interested in an interaction and for their welfare needs to be met, they should be given freedom to refuse (J. A. Serpell et al., 2010). Similarly, nature may not always provide a consistent sensory experience: a trail walk may at times be overstimulating after it has rained and is full of new smells and slippery mud. At other times this same trail may elicit a grounding experience for children and youth as they observe a light breeze or watch a family of ducks make their way across a pond (Swank & Shin, 2015). This supports the argument that having multiple types of nature-based interventions on hand is still beneficial; if one intervention does not actively facilitate the desired therapeutic goal, another may have the appropriate qualities at the given time. It also strengthens existing research in illustrating the importance of actively evaluating an intervention and the qualities it is currently presenting for a particular child or youth (Harper et al., 2019; Pedersen et al., 2012).

Cumulatively, in reflecting on nature-based interventions, experienced staff deemed it essential to identify and align the qualities presented by the nature-based resource and the child or youth's skills, needs, and goals. Given that qualities of a nature-based intervention are prone to change and one's relationship to them often develops over time, knowledge of the child or youth's tendencies in relationship to each spectrum can assist staff in making intentional selections and ongoing assessments of suitability of an intervention. The findings indicate that limited access to a large variety of nature-based interventions need not inhibit practitioners from implementing nature-based interventions. Since many interventions share key qualities and any one intervention can be incorporated in a number of ways, diverse types of nature-based resources can provide the foundation for a nature-based intervention if appropriately matched to a child or youth's relationship to the qualities of the resource type.

Limitations

While this study provides valuable insights, it had several limitations. First, this study was limited to staff perceptions of the impact that nature-based interventions had on youth with whom they worked. While these insights can support our understanding of youth experience, future research should collect information from children and youth directly. Second, the study was conducted at a mental health treatment and special education school that is well known for its incorporation of a broad variety of nature-based interventions. This setting may have biased the respondents' perceptions of the positive impacts of nature-based interventions on youth, as opposed to recognizing the possible negative impacts. Third, the interviews were conducted with staff from a single organization and their views may not generalize to practitioners who use nature-based interventions in other contexts. Despite these limitations, this study offers important insights that combine the perspectives of experienced and diverse staff regarding incorporation of nature-based interventions in a residential and day treatment school.

Conclusion

This study provided an opportunity to combine the perspectives of staff with expertise in nature-based interventions from diverse professional backgrounds. Nature-based interventions have been explored in many different contexts (Balluerka, 2015; Hartwig, 2017; Stefanini et al., 2016), and often research is organized around the animal species incorporated in the intervention (Frederick et al., 2015; Jones et al., 2019). Few studies have considered whether a specific species of animal or type of nature is truly a requirement for positive nature-based interventions. This study yielded new insights into how staff with different areas of expertise support children and youth in their growth through the quality spectrums of physical interactions, gratification, emotional experience elicited, stimulation, and familiarity. These qualities presented themselves across species of animals according to experienced staff, supporting our belief that intervention qualities should be prioritized when considering intervention selection. As programs that use nature-based interventions become increasingly common, it is necessary to keep in mind the overlap and differences in the qualities exhibited by diverse nature-based resources and how they can be beneficially incorporated in a wide range of contexts.

Practice implications

- When integrating nature-based interventions, experienced staff selected resources based on qualities rather than breed or type.
- Qualities staff considered included delayed or immediate gratification, type of emotional experience elicited, familiarity, and stimulation.
- Staff at other sites could use what they can access – even spiders or a plant – to support students.

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