

Home garden to sensory play space: Paving the way to quality outdoor play.

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Received: 23 October, 2023, Manuscript No. AAJCP-23-114894; **Editor assigned:** 25 October, 2023, Pre QC No. AAJCP-23-114894 (PQ); **Reviewed:** 10 November, 2023, QC No. AAJCP-23-114894; **Revised:** 17 November, 2023, Manuscript No. AAJCP-23-114894 (R); **Published:** 24 November, 2023, DOI:10.35841/0971-9032.27.11.2081-2085.

Abstract

Background: The home environment is the most important location in children's lives and outdoor play has indisputable health benefits. Disconnection from nature has a strong link with childhood disorders such as Attention Deficit Hyperactivity Disorder (ADHD) and one reason for the alarming increase in incidence of ADHD may be the diminished availability and accessibility of outdoor opportunities to engage in multi-sensory nature play. Hence, this pilot study aims to redesign existing home garden to outdoor sensory garden-play space and tests sustained attention.

Methods: A 9-year-old male child with a diagnosis of ADHD received a total of 10 home based-Sensory Garden (SG) plays intervention sessions over a 2-week period. Interventions occurred 5 days a week. Screening was done using ADHD rating scale and short sensory profile. Outcome, activity recording time was measured by noting the undistracted duration spent on writing and reading task. Mother maintained daily journal to record impressions of child's participation in SG play and child's progress at home and clinical activity participation was recorded in observation notes.

Results: Increase in Activity recording time, mother's daily recordings and activity engagement in clinical setting suggested home-based sensory garden, a redesigned home garden space promotes positive play engagement.

Conclusion: We don't necessarily need to travel far to enjoy nature. These findings suggest that the available home garden space which has no playability element has the potential to be redesigned to sensory garden play space to facilitate outdoor multi-sensory nature-play with lasting influence on family as a whole.

Keywords: Sensory garden, Outdoor play, Home garden, ADHD, Sustained attention.

Accepted on 21st November, 2023

Introduction

Play is at the heart of all children. Play is child's most comfortable and natural form of expression [1,2]. Playing is another indicator of a child's development and wellbeing in terms of physical, emotional, cognitive, and executive functions and child's long-term health [3,4]. To affirm the importance of play United Nations convention on the rights of the child [5] article 31 recognized play as a fundamental need and right of children including children with disability. The physical environment is considered to be a significant critical factor in child's play and development [6]. Play spaces that provide multi-diverse play opportunities keep the children actively engaged for extended periods of time and access to such environments are paramount [7]. Outdoors offer possibilities for interaction with nature and natural materials and provide richer environment with manifold benefits for holistic health offering more complex and varied play [8-11]. Furthermore, the specific features and stimuli of these outdoors can hardly be replicated indoors. Despite plethora of benefits, playing outdoors is often neglected [12].

Children with disabilities are at distinct disadvantage when it comes to play as they engage in less complex and fewer play behaviors than the typically developing peers when given the same materials in the same settings [13,14]. Studies have reported that access to green space for example parks, gardens, allotments and woodlands that are increasingly recognized as "natural capital" was associated with enhanced cognitive skills and better scores on tests of attention in school children [15]. These health advantages may extend to children with Attention Deficit Hyperactivity Disorder (ADHD), the most prevalent developmental disorder with core symptoms of inattention, hyperactivity, and impulsivity, which often persists to adolescence and adulthood. It's expensive long-term nature of the disorder presents a major public health challenge. One of the main symptoms of ADHD is Inattention. Our current focus of the study is on the symptom of inattention, difficulty to stay focus on task or sustaining attention on task performance, which can have a negative impact on academic learning.

Evidence suggests nature exposure as one of the modifiable risk factor that alleviates the symptoms of ADHD. Access to green space has a beneficial impact on children's cognitive

development and mental health. Caregivers noticed the symptoms of ADHD improved after exposure to relatively greener settings. Residential green space had a positive impact in school children with ADHD and reduced the need of medication. Furthermore, activity participation in outdoor sensory garden play resulted in a better functional performance in ADHD children.

A Sensory Garden (SG) is a self-contained space with plants of desired sensory qualities and landscape elements where one gets immersed and engages in rich sensory experience. Most gardens appeal to senses in one or other way. A sensory garden is skillfully designed with plants, hard landscape features and other garden elements to maximize the impact of all senses beyond one's visual appeal. Taking into account the sensory element, they draw the users to touch, taste, smell, interact, explore and experience the garden environment with all senses. It offers a helpful resource for a variety of purposes from developmental progression, education, therapy and recreation. Sensory garden for special needs children is a place to play and explore outdoors while promoting sensory stimulation, physical mobility and social skills in safe environment. Evidence supports the quality of performance of children with ADHD in the indoor activities was statistically higher with prior exposure to outdoor sensory motor play in an economically developed SG in clinical setting.

Case Presentation

Why home-based outdoor sensory play?

Children with disabilities are known to spend more time at home as they need to engage extra amount of time on self-care and/or therapy activities and also have diminished outdoor playtime than typically growing children. Not all urban clinical settings have enough open space outside the facility for outdoor play. Therefore, the home environment is of particular importance in relation to child's experiences of play. While the importance of outdoor play is well known, its usage is drastically diminishing. Attention recovery theory and stress reduction theory are the two complementary theories that support the nature-based environments to be more restorative and encourage quality play than non-nature-based environments as nature/green outdoors initiate relaxation and play asks for attention and involvement.

Furthermore, researchers observed a positive response from 3 parents/caretakers to replicate SG's at their homes according to the child's need and space constraints and subsequent benefits were appreciated. Hence, outdoor home gardens were chosen as play settings. But not all gardens are suitable for outdoor play. To maximize successful and quality play experiences in home gardens a "playability" element in the home garden was essential to be introduced. Therefore, in response to need gap, the aim of our study was to redesign the existing outdoor home garden to playable sensory garden with rich sensory experience to explore and increase on indoor "time on task" effect.

This was a single 3 week-case study using redesigned home garden to sensory-rich garden for subsequent use for a 9-year-

old boy presenting predominantly inattentive ADHD. His academic performance was poor and needed longer time to do any kind of task. Both the parents had concern for his school performance. The participant was screened using ADHD rating scale and short sensory profile. No comorbid mental retardation, autism, visual impairment, hearing impairment and any other developmental disorders. Instruments used were ADHD rating scale for ADHD symptom screening and Short Sensory Profile to identify individual sensory diet.

Attention duration, activity recording time (time-on-task) was the outcome tool. Writing and reading task from moral story book in regional language, Tamil was chosen to record activity engagement time. After formal approval, the study commenced with week 1-baseline week, during which the participant received conventional routine indoor intervention at a regular clinic attended by the participant. At the end of the week, activity recording time was noted. The baseline week-week 1 score was the control.

The study proceeded to week 2-first intervention week, where the participant was exposed to outdoor redesigned sensory garden play space at his home for 30 minutes prior to routine indoor conventional intervention for 45 minutes at a regular clinic centre. At the end of week 2, following 5 intervention sessions (morning), activity recording time was noted. The week 3-the second intervention week was a duplicate of the week 2-first intervention week, and activity recording time was repeated at the end of the week. Figure 1 depicts the study design.

During intervention phase of 2 weeks, the Mother was asked to maintain daily journal and jot down her impressions of child's participation in SG play and child's progress. Information session on the study was held with the mother and obtained informed consent and verbal assent of the child.

Sensory Garden plays space, a re-designed home garden

Available home garden space with mixture of shrubs, vegetables and perennial plants was skillfully converted to a user friendly, low-cost natural sensory garden play space. Mix up the existing presentation with creeping and hanging miniature plants along with scented plants. The major key principle was to transform the existing "non-playable" home garden into a stimulating "playable" active environment which allows maximum potential of the available site to explore and enjoy with a degree of independence through naturally available elements. Playability element was introduced through various sensory elements of nature which provide opportunity to explore and engage with diverse senses namely visual (sight), auditory (hearing), gustatory (taste), olfactory (smell), tactile (touch), proprioceptive (position sense) and vestibular (balance).

The activities categorized into 3 zones-sensory (sound, smell, sight), sensory-motor (tactile pathway, movement and balance) and rest zone. The design objective was to provide variety of textures, colors, sounds, movements and to offer every day experiences. Loose textured materials like coarse gravel, sand,

dried leaves, bricks and a small patch of natural grass marked the textural pathway. To liven up the space, a water feature was included with smooth pebbled stones. Climbing element was added to the fence along with hanging wind chimes. Stone seating area was added to sit back, relax and admire the garden elements. Thus, the home-garden was modified to a playable therapeutic space to offer just the right challenge through sensory-motor fun-based activities with maximum sensory delight.

The Intervention-sensory garden free play

During the intervention weeks (2 weeks-10 sessions), the participant was engaged in sensory garden which was a redesigned home garden. The child was allowed to explore and engage in outdoor sensory-motor free play. Sensory diet through outdoor play consisted of all senses namely visual, auditory, olfactory, gustatory, tactile, proprioceptive and vestibular senses. Free play activities include climbing, balancing, jumping, sand play, water play, sensory walkway and pick up twigs/stones/dried leaves. Moveable objects were placed to lift, carry, push and pull. Logs and steps provided graduated levels of instability. After engaging in outdoor sensory play at home for 30 minutes, the participant attended routine indoor conventional intervention at a regular clinic for 45 minutes in the morning (Figure 1).

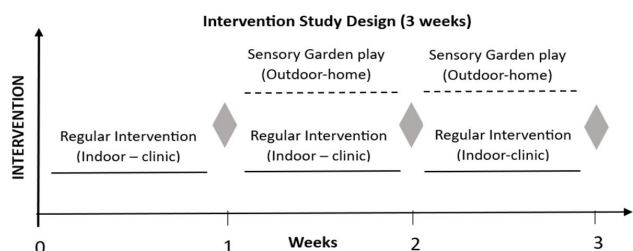


Figure 1. Intervention study design of 3 weeks. (◆): Activity recording time (writing task).

Results

The intervention was delivered to the participant on a total of 10 sessions over the 2-week intervention period, 5 days in each week. Following total of 5 and 10 intervention sessions, the activity recording time was recorded. The results of the activity recording time are outlined in Tables 1 and depicted (Figure 2).

	Activity recording time (min)	
	Writing task time	Reading task
Baseline (Week 1)	6	4
1 st Intervention week (Week 2)	11	8
2 nd Intervention week (Week 3)	20	14

Table 1. Activity recording time is outlined.

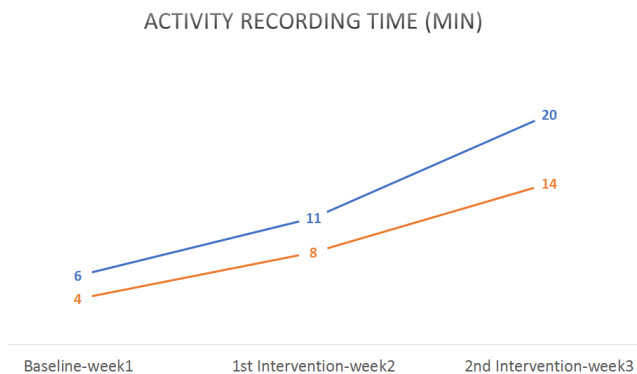


Figure 2. Intervention sessions, the activity recording time was recorded.

Mother’s journal

The child’s progress of minimal changes observed during the home sessions were noted in the journal. Mother was thrilled and excited to see her son attend spontaneously to different play activities. Textured walkway particularly the grass piece fascinated the child with glee in his eyes followed by water play. Prior to intervention the child shifts to tasks quickly but post-SG play the child’s sustaining of attention on a given task was much better especially homework completion with clearer legibility. Post intervention after 2 weeks, the child is much calmer in completing school home works and house hold activities. Furthermore, outdoor SG play has fostered parent-child conversation with enjoyable participation and eased mother’s efforts.

Discussion

The purpose of the study was to determine whether outdoor home based-sensory garden play along with clinic-based indoor conventional intervention would yield greater improvement on attention time of child with ADHD. Above study confirmed that the outdoor play exploration in home based sensory garden prior to clinic based routine conventional intervention had higher benefits on focus and sustain attention on task performance in clinical setting. This finding upholds and expands existing evidence to integrate “sensory value through natural elements”. The restorative effects of nature relatively alleviated the symptoms of ADHD specifically inattention and hyperactive behavior enabling the child post outdoor sensory play to sustain focus and perform better in indoor clinic-based activities. The child was less fussy in the clinic and was able to complete the given routine activities quickly while enjoying them. This finding can be attributed to the multi-sensory aspect of nature experiences that may have distressed the child prior to indoor intervention and further contributed to sustain attention and have better indoor task performance. Furthermore, monotony of indoor stimulation can be a source of stress and stimulation of multiple senses through elements of nature itself can prepare one’s positive mental state and promote calming effect.

Better gains in attention focus in indoor activities could be attributed to connectedness to natural environment enriched

with elements of nature paving the way to nature-based play. The sensory motor activities offered rich sensory experiences through free play. Nature exploration and experience of different sensory elements how it feels, sounds, smells and moves encouraged the child to actively play and explore the surrounding in one's own level of comfort ability. Additional to increased 'time-on-task' duration, reduction in performance errors also was noted in the clinical setting. These results strongly support active engagement during walking in restorative setting also reduces commission errors. According to ART, attention can be restored with person-environment interaction. Body of research validates nature's fascination to play a crucial role in activating involuntary (effortless) attention and thus allows directed attention to rest, recover and subsequently promotes ease of performance in cognition demanding tasks.

Current findings are consistent with existing research wherein caretakers indicated reduction of ADHD symptoms thereby resulting in better performance after play exposure to relatively greener area. In addition, a field study also reported, after-play in a natural setting compared to built setting, children with ADHD performed better on a concentration task with fewer errors. Furthermore, a significant improvement in children's attention performance was also implicated after an individual guided walk in a park just for minimal duration of 20 min.

The customized outdoor environment offered diverse sensory experiences. It is worth to note as the play space is within home premises and encouraged safe exploration, caretaker could minimize the levels of supervision and allowed child to choose play opportunities. At times child was found to be actively engaged even away from the gaze of the adult who observed child's play preferences in secret. This built confidence in parents to encourage child to have some degree of choice and be flexible in their use of guidance.

Prior Outdoor exploration added additional benefits by minimizing the resource intensiveness of indoor intervention as children were much calmer and relaxed. Furthermore, it encouraged adherence to regular conventional intervention offered at the centre. This research has raised some valuable points concerning sensory gardens. Own SGs could be created with professional guidance on sensory diet and design to help improve the holistic development of users. The restorative opportunities such as development of adapted sensory gardens, hands-on at the home environment can offer a vital importance to healthy functioning of children.

The sensory-motor activities of SG have impacted the child to anticipate in eagerness to engage in the play setting. In this regard, child with ADHD showed positive effects on behavior change and increased focus on task performance. Besides the child, the benefits of redesigned home garden were experienced by the caregiver (mother) as a place to engage with landscape elements and a place to relax and have self-time. It was interesting to note, textured pathway with varied tactile experiences and stone scooping water activity greatly enabled both child and mother engagement. Sensory features imparted chance to pluck, feel, smell, talk about it and

consequently encouraged better parent-child interaction. As the child has shown his attachment to the play setting, the zones in SG play space may also be used as a reinforcement strategy. Despite overwhelming positive response of the pilot study, limitations associated with case studies, the current work provides preliminary evidence of feasibility, user friendliness and benefits of home-based sensory garden play so that it may be considered as an adjunct to intervention protocols for similar cases.

Conclusion

Every child is entitled to quality and wholesome play experiences in their own homes. In order to maximize children's play experiences, the family has a significant role to provide successful and just the right level of challenge of play opportunities at home. To achieve optimal development, it is crucial that caregivers are equipped with right tools and knowledge and flexibility to create quality play environments at home-setting. The concept of sensory garden must be appropriate and personalized according to the sensory requirements affording children to participate actively and explore the environment with optimal independence. The sensory-motor activities have a large effect on holistic development of children.

References

1. Ginsburg KR, Committee on psychosocial aspects of child and family health. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics* 2007; 119(1): 182-91.
2. Boucher S, Downing J, Shemilt R. The role of play in children's palliative care. *Children* 2014; 1(3): 302-17.
3. Sutton-Smith B. Evolving a consilience of play definitions: *Playfully*. *Play and Culture Studies* 1999; 2: 239-56.
4. Koukourikos K, Tzaha L, Pantelidou P, et al. The importance of play during hospitalization of children. *Materia socio-medica*. 2015; 27(6): 438.
5. Lundy L. Children's rights and educational policy in Europe: The implementation of the United Nations convention on the rights of the child. *Oxford Review of Education* 2012; 38(4): 393-411.
6. Sando OJ. The physical indoor environment in ECEC settings: Children's well-being and physical activity. *Eur Early Child Educ Res* 2019; 27(4): 506-19.
7. Herrington S, Brussoni M. Beyond physical activity: The importance of play and nature-based play spaces for children's health and development. *Curr Obes Rep* 2015; 4(4): 477-83.
8. Nicholson S. The theory of loose parts, an important principle for design methodology. *Studies in Design Education Craft and Technology*. 1972; 4(2): 1-6.
9. Fjørtoft I. Landscape as playscape: The effects of natural environments on children's play and motor development. *Children Youth and Environments* 2004; 14(2): 21-44.

10. Luchs A, Fikus M. Differently designed playgrounds and preschooler's physical activity play. *Early Child Development and Care*. 2018; 188(3): 281-95.
11. Loebach J, Cox A. Playing in 'The Backyard': Environmental features and conditions of a natural play space which support diverse outdoor play activities among younger children. *Int J Environ Res Public Health* 2022; 19(19): 12661.
12. Stephenson A. Opening up the outdoors: Exploring the relationship between the indoor and outdoor environments of a centre. *Eur Early Child Educ Res* 2002; 10(1): 29-38.
13. Barton EE. Teaching generalized pretend play and related behaviors to young children with disabilities. *Exceptional Children* 2015; 81(4): 489-506.
14. Kasari C, Chang YC, Patterson S. Pretending to play or playing to pretend: The case of autism. *Am J Play* 2013; 6(1): 124.
15. Dadvand P, Nieuwenhuijsen MJ, Esnaola M, et al. Green spaces and cognitive development in primary schoolchildren. *Proc Natl Acad Sci* 2015; 112(26): 7937-42.

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